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AMERICAN JOURNAL OF OPHTHALMOLOGY

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ORGANIZATION AND DEVELOPMENT OF THE SCHOOL OF OPHTHALMOLOGY.

U. S. GENERAL HOSPITAL, No. 14, FORT OGLETHORPE, GA.

G. E. DE SCHWEINITZ, LT.-COLONEL, M. C., U. S. A.

Authority to publish granted, Board of Publications, S.G.O., October 30, 1918.

The present article does not concern itself with the various courses of instruction in medicine, surgery and sanitary science in the Medical Officers' Training Camp in Camp Greenleaf, Chickamauga Park, Georgia, but only as the title indicates, with the School of Ophthalmology.

Prior to its organization, this school had been in contemplation for a considerable period of time. Therefore, from June 15th to June 20th, 1918, with the approval of Colonel E. L. Munson (now Brigadier General), Commandant of the Camp, the writer made a preliminary survey of the available buildings and the clinical material, the possible courses of instruction in ophthalmic work and in cooperation with other schools already established, or in process of establishment, the laboratory facilities, the staff required, and the standards for admission. The results of this survey, incorporated in a report which was submitted to the Surgeon General and to the Commandant of the Camp, were approved.

On July 23d the writer was directed to proceed to Philadelphia for the purpose of collecting the necessary equipment, and upon completion of this duty to proceed to the following named places for the purpose of organizing the ophthalmic instruction, to-wit: Camp Greenleaf, Chickamauga Park, Ga., and U. S. General Hospital, No. 14, Fort Oglethorpe, Ga., and upon

completion thereof to return to his proper station in Washington. Pursuant to this order, the writer, after collecting the equipment, to which reference will be made later, proceeded to Fort Oglethorpe, Ga., and immediately began the work of organization of the Ophthalmic School which he had been directed to undertake.

The Building.—A new two-story ward-building was placed at the disposal of this work, to which building, after completion of the necessary alterations, the Ophthalmic Service was transferred. It is now officially known as Ward 30, Division A, of U. S. General Hospital, No. 14. The first floor has been arranged and equipped as follows:

There are two rooms for refraction, each provided with trial cases, standard test-type cards, all the necessary apparatus for muscle testing, and with blackboards utilized during the hours of instruction. Should it become necessary, additional apparatus can readily be installed.

Adjoining the rooms for refraction, eight stalls for retinoscopy and ophthalmoscopy were erected. These stalls face a large room where the class of student officers may gather during the hours of didactic instruction and lantern-demonstration, and where perimetry is taught and practised. The stalls for retinoscopy and ophthalmoscopy are hung with heavy curtains,

which can be drawn aside or not, as the conditions require; and in the central one a lantern screen is readily adjusted, its dark surroundings enhancing the distinctness of the pictures. If necessary, the lantern can be moved to either of the refraction rooms, and there used in the lectures on the theory of refraction and physiologic optics. The refraction room, and the one containing the retinoscopy stalls are in communication with it through a doorway. There is a large room in one end of which the appliances for the practical optician's work are stationed, and where all of the adjustment is made of the spectacle frames in which the lenses, ground according to the formulas furnished by the ophthalmologists, are mounted. In this room, as at present arranged, are also the tables for the clinical clerk, who records each patient referred to the Service and who makes the preliminary visual tests, takes the history, etc. Between the area devoted to the optician's work-table and the record-table there is ample space and equipment for the treatment of the external diseases of the eye. This room communicates by a double doorway with a covered porch which runs the whole length of the building, and which was utilized during the summer as a waiting-room. Should this prove not to be practical in the winter, space for a waiting-room can be provided within the building itself.

Facing the large room previously described are a room for operations on animals' eyes (pigs' eyes, sheep's heads, etc.), a small, well-equipped room for operations on human eyes, and an office for the Chief of Service and for storing the records. A commodious, admirably-appointed operating room in the Oto-Laryngological Building, which adjoins the Eye Ward, is also at the service of the ophthalmologic staff. Operations requiring general anesthesia are here performed.

In the remaining space of the first floor of the Eye Building is situated a ward of sixteen beds; but should additional beds be required, they can be secured in a long ward which occupies the entire second floor of the structure.

Rooms for nurses, linen, toilets, etc., have their usual relationship to these wards.

Such an arrangement of communicating rooms renders the examination and the assortment of patients easy; and is advantageous in the division of the student officers into classes, according to the work to which they are assigned; that is, the treatment of external diseases of the eye, perimetry, retinoscopy, ophthalmoscopy, ward instruction, operations, refraction, etc.

Equipment.—In addition to the usual equipment for an active Eye Service which is to be utilized in teaching, to-wit: trial cases, perimeters, surgical instruments, stereoscopes, giant magnets, tonometer, etc., certain special equipment was procured, as follows: (1) A lantern for the projection of opaque objects and slides; (2) several hundred lantern slides, for the most part duplicates of those used by Lieut. Col. de Schweinitz in the University of Pennsylvania, to which, through the kindness of Dr. Howard F. Hansell and Dr. William M. Sweet, a number of slides were added, duplicates of those employed in the Jefferson Medical College; (3) about 200 microscopic slides illustrating the histology and pathology of the eye, being duplicates from the collection of Lieut. Col. de Schweinitz in his laboratory at the University of Pennsylvania; (4) sets of Oatman's plates ("Diagnostics of the Fundus Oculi"), with the necessary stereoscopes; (5) a thermophor.

The Clinical Material.—The material for the clinic and the course of instruction is obtained (a) from the regular dispensary service of U. S. General Hospital No. 14; (b) from the patients in the eye-ward of the same hospital; (c) from the recruits as they are examined in the Camp Infirmary of Camp Greenleaf and the Recruit Depot at Lyle; (d) from the patients in the general medical, surgical and the neurological wards of U. S. General Hospital No. 14.

The Student Officers.—The student officers in the Medical Officers' Training Camp are assigned to the various schools in operation according as they

qualify in the preliminary examinations, which are held daily for the purpose of making this selection. The largest number of those who find entrance into the School of Ophthalmology have, prior to their assignment to Camp Greenleaf, been "exempt to ophthalmology," on the files of the Surgeon General's Office; but a certain number are selected from among those who have entered the service without such exemption, but who at their original investigation on arrival at the Camp have expressed a preference for this special type of medical and surgical work. The preliminary entrance examinations are always conducted either by the Director of the School of Ophthalmology, or by one of his staff, and should the applicant qualify for the school, as soon as he has completed his period of military training he receives his assignment, these assignments being made on the first and fifteenth of each month.

Length and Outline of the Course.—The length of the course is four weeks. The hours of instruction are daily from 9:30 to 11:30 A. M. and from 1.30 to 4:30 P. M., except on Saturdays, when the instruction, which consists in a series of quizzes covering the week's work, concludes at 11:30 A. M.

The outline of the course may be briefly summarized, as follows: Two hours daily, except on Saturdays, of systematic didactic teaching, including a review of the theory of refraction, muscle testing, other functional testing, anatomy and histology of the eye and its appendages, external diseases, ophthalmoscopy, ophthalmic neurology and operations. These lectures are illustrated by means of the lantern, diagrams, freehand drawings, etc. Particularizing as to the days: On Mondays and Tuesdays three and one-half, and on Wednesdays, Thursdays and Fridays one and one-half hours are devoted to practical instruction in refraction, muscle testing and diseases of the eye. On Wednesdays, Thursdays and Fridays two hours on each day are devoted to operative ophthalmology, the Director or one of the staff performing operations on the patients who come to

the Eye Service in General Hospital No. 14, and on patients referred to the Director through the courtesy of one of the eye surgeons in Chattanooga. The student officers themselves perform the usual operations on pigs' eyes and sheep's heads.

During each course two lectures of two hours each are given to the combined class of ophthalmology and otolaryngology, one on the eye complications of sinus and mastoid diseases, and one devoted to the subject from the standpoint of the otolaryngologist. At the request of the Director of the School of General Surgery, two lectures are given to his classes during the course on the treatment of injuries of the eye, and two hours per week are devoted to practical work in ophthalmoscopy.

During the course two hours are set aside for instruction in the bacteriology and pathology of the eye; and this instruction is given in conjunction with the Department of Pathology, and concerns itself with the study of the sections to which reference has been made and with the bacteriologic examinations of the conjunctival sac, corneal ulcers, etc. One hour is devoted during the course to X-ray localization of foreign bodies in the eye, under the auspices of the X-ray department. Through the courtesy of the Department of Surgery, the Class in Ophthalmology has the opportunity of devoting one hour daily to eye work in the genito-urinary ward of U. S. General Hospital No. 14, going to these wards in sections, and having the advantage, therefore, of studying the specific infections of the eye. The same opportunity, and in a similar manner, is afforded the class in the medical, neurologic and surgical wards of the hospital, whereby a wide range of ophthalmoscopic work is covered.

Each Saturday morning a quiz is conducted by the Director and instructors, one hour for the class as a whole, and one hour for sections of the class. The quizzes are both oral and written, and the week's work is reviewed. During ward instruction practical paper work, the method of keeping records

and cross-indexing is demonstrated. Naturally, the schedule of instruction is elastic, and the number of hours assigned to any particular topic may be altered as is deemed necessary.

Examinations.—The examinations for entrance into the School of Ophthalmology have been briefly referred to. At the conclusion of each four weeks' course the student officers of the class are graded according to their personality, according to the character of their work, both practical and theoretical, of which cognizance has been taken by each instructor, who turns in his report on each officer with whose work he has been specially concerned, and according to an examination which is both oral and written. All reports and examination papers are reviewed by the Director of the School, who determines the grade. It is upon this final examination, thus arranged, that the officer's ultimate retention for ophthalmic work in the army is based.

The Ophthalmic Staff.—It was determined that the personnel of the Ophthalmic Staff should consist of a Director of the School who should also be Chief of the Ophthalmic Service of U. S. General Hospital No. 14, and eight instructors, one of whom should also act as Ward Surgeon. Naturally the number of instructors is subject to change, according to the needs of the school and the character of the classes. The instructors were carefully selected according to their qualifications, determined by their records as teachers and practical ophthalmic surgeons in civilian life, prior to their entrance into the Medical Corps of the Army.

Owing to the cordial coöperation of Colonel (now Brigadier General) E. L. Munson, then Commandant of the Camp; Colonel Robert Brooke, Senior Camp Instructor; Colonel Gregory, Commanding Officer, Medical Officers' Training Camp; Lt. Colonel Havercamp, then Commanding Officer of U. S. General Hospital No. 14, and the excellent help of Major Meyer Wiener, Captain Alfred Cowan, and Lieutenant M. E. Brownell, and much aided by Lt. Colonel Edward Martin, Director of the School of Surgery and Chief of the

Surgical Service of U. S. General Hospital No. 14, and Lt. Colonel Thomas J. Harris, Director of the School of Otolaryngology which had been in flourishing operation for several months, the work of organization proceeded rapidly.

On August 7, 1918, preliminary lectures and demonstrations were begun, and on August 12, 1918, the formal opening of the School took place. On August 22, 1918, the School having been in full and smooth operation for nearly two weeks, the writer, with the approval of the Commandant, confirmed by the Surgeon General's Office, Division of Surgery of the Head, turned it over to Major Meyer Wiener as Director, who has since that time, with skill and fidelity, conducted its affairs according to the plans which have been outlined. The Staff at present is as follows:

Major Meyer Wiener, Director and Chief of Service.

Major H. M. Morton, Instructor.

Captain Alfred Cowan, Instructor.

Captain S. T. Hubbard, Instructor.

Lieutenant M. E. Brownell, Instructor.

Lieutenant L. G. Campbell, Instructor.

Lieutenant C. P. Dyer, Instructor and Ward Surgeon.

Lieutenant T. J. Moran,¹ Instructor.

Lieutenant F. O. Schwartz, Instructor.

The School of Ophthalmology has been organized and is in operation for the purpose of training ophthalmologists who have entered the service as such and are assigned to the Medical Officers' Training Camp for instruction. It affords to student officers, even tho they have in civilian life devoted long periods of time to eye work, an opportunity for postgraduate ophthalmic instruction which has proved to be of the utmost service. It permits all those who are engaged in this work, either as instructors or as student officers, to approach their duties from the

¹ Lieutenant Moran died during the recent epidemic of influenza. He was an accomplished officer and an admirable teacher.

military standpoint and its necessities, not only as they exist here, but as they obtain overseas. The advantage of observing and learning the technic of the ocular examination of recruits and registrants is a good example of the type of such work. In so far as possible, emphasis has been placed on the instruction which fits the officers for ophthalmologic service abroad. In this respect the observations which the writer was able to make during several months of inspection in France and England of British, French and our own hospital systems, have been utilized in preparing the schedules of instruction, supplemented by advices received from time to time from the overseas eye service.

A feature of importance in the School of Ophthalmology is the work which has been maintained in coöperation with the other schools at Fort Oglethorpe, to which reference has already been made, notably the School of Surgery and Anatomy, the School of Otolaryngology, the X-ray Department, and the Departments of Pathology and Bacteriology. The excellent opportunities for medical ophthalmoscopy in the wards of U. S. General Hospital No. 14 have been noted. The recently established School of Oral and Plastic Surgery has already made it possible for the student officers of the Ophthalmic Classes to learn in a broad sense the principles of plastic surgery so necessary in acquiring the technic of blepharoplastic work—operative work of the utmost importance in ophthalmic war surgery.

The School and its work puts the Surgeon General's Office in possession of information according to which requests for the assignment of ophthalmologists to various base hospitals in this country and base and evacuation hospitals abroad can be made with an intelligent understanding of their capabilities, because each week the records of the student officers in practical work and their grades acquired according to examinations are transmitted to those who are responsible for their assignment.

As has been pointed out, the preliminary examinations for entrance into the School of Ophthalmology decide whether it is desirable that the student officer shall enter the class for ophthalmic training, or whether his acquirements are such that he can be more suitably employed in some other department of military medical or sanitary science. These examinations further decide whether the previous training and experience of the student officer in civilian life has been such that it is unnecessary for him to add to his ophthalmic qualifications, i. e., whether he shall be at the conclusion of his military training immediately assigned to ophthalmic duties here or abroad. But for those who enter the school it is the final examination after the completion of the course which determines whether an officer shall continue his work in the army as an ophthalmic surgeon, or shall be assigned to other types of work for which he is more definitely suited.

The clinical material which has been available for this school has been unusually rich, largely on account of the permission which was granted that the recruits who are examined, as before stated, shall be utilized for ophthalmic examination. The cases which come under observation and those retained for treatment compare favorably with those in any active ophthalmic service in civilian life.

Altho the number of operations on human eyes is comparatively limited, excellent material in this respect is available, and all the important ophthalmic operations are readily demonstrated by means of sheep's heads and pigs' eyes, and not only demonstrated, but the student officers themselves are given the opportunity to perform them. The pigs' eyes are removed with all of their orbital attachments and surrounded by a considerable area of the skin, and therefore with complete preservation of the lids, making it possible to perform the important ophthalmic operations exactly as if they were being done on the human subject. This method of using pigs' eyes is due to the ingenious thought of the present

Director of the School of Ophthalmology.

Prior to the establishment of the Ophthalmic School the attendance in the Eye Service was about 260 new patients a month. This attendance has rapidly increased until at the present time the new patients per month amount to between 500 and 600, and during periods when large numbers of recruits are sent from the Recruit Depot and Camp Infirmary for examination, (and all of the recruits presenting interesting ocular findings are referred to the eye clinic) as many as 1,500 new

patients have been examined in one month. Naturally, the recruits are not retained as patients, but none the less they are utilized in the ophthalmic instruction.

Under the supervision of the present Commandant of Camp Greenleaf, Colonel W. N. Bispham, and the effective administration of Major Wiener and his staff, the school has steadily increased in value and may justly claim an honorable position in the work of the Medical Corps of the United States Army.

OPHTHALMOSCOPIC CONDITIONS SIMULATING SARCOMA OF THE CHOROID.

HARRY FRIEDENWALD, M. D., F. A. C. S.

BALTIMORE, MD.

Report of two cases resembling sarcoma of choroid in which after enucleation the pathologic diagnoses were granuloma of the choroid and tumor formation associated with retinitis and massive exudation, with citation of cases more or less similar recorded in the literature. With two plates and illustration in the text. Read before the American Ophthalmological Society, July 10, 1918.

The diagnosis of choroidal sarcoma may be difficult. The tumor may be hidden in front of the ophthalmoscopic field, or behind a detached retina. But when a neoplasm is clearly seen within the eyeball by means of the ophthalmoscope, the only question which ordinarily arises is, whether it is a choroidal sarcoma or a retinal glioma. Other forms of neoplasm are of such rare occurrence that they are scarcely ever taken into consideration. And the differentiation between sarcoma and glioma is ordinarily determined by the age of the patient, as well as by the difference in the appearance of the growths.

In reporting the following cases, I believe that I am presenting conditions of unusual rarity, the character of which could be definitely established only by pathologic examination.

CASE I.—The patient, a young girl, had been under the care of Dr. Louis P. Hamburger since the beginning of 1908. She was then eleven years of

age and consulted him because of headache. The diagnosis was neurasthenia. Her family history was negative. The patient had had measles, chickenpox and whooping cough. She was a girl of small build, fairly well nourished. There were occasional choreiform movements about the head, mouth and eyelids. A complete examination was negative in all other respects. In spite of the treatment, the condition remained the same and the chorea became more active at times. During 1914 she was seen by Dr. Hamburger a number of times because of the constant headache, and in December she was under the care of Dr. Sydney M. Cone for scoliosis.

The patient was first seen by me in November, 1900, when she was brought for a slight blepharitis. I saw her again June, 1904, at which time she complained that the eyes pained her when reading; both eyes had perfect vision and a very low degree of hyperopia. In November, 1907, she was

again examined and her glasses were changed. At this time an examination was made under atropin, and her hyperopia was found to be 1.50 in each eye, with perfect vision.

In January and February, 1911, she was again examined and again the same hyperopia was found. The right eye showed, $+1.5$, vision $6/4$, almost perfect; left eye $+1.5 \text{ C} -0.5 \text{ c. ax. } 120^\circ$, vision $6/4$, almost perfect. The left glass was changed to correspond with this examination.

In January, 1912, another examination was made because of eye ache and of blurred vision; but I found perfect vision in each eye with the correcting glasses.

On March 7, 1915 (her age was then 18), she again came to consult me and complained of circles and flashes of light seen frequently in the right eye. The vision of the left was perfect. The central vision of the right eye was almost perfect, not quite as good as that of the left.

Examining the fundus of the right eye, I found in the upper nasal quadrant, reaching to a point near the upper inner margin of the disc, a large bluish-gray, rounded, elevated mass, the highest part of which could be seen with $+12 \text{ D}$. The projection of the growth was therefore, about 10 D into the vitreous, indicating a thickness of a little more than 2 mm . The extent of the growth is six or eight times that of the optic disc.

An examination of the field of vision taken March 8, 1915, showed a large defect including the blind spot; and reaching downward to a meridian 30° below the horizontal, and upward to a meridian almost 60° from the horizontal. The outlines of the field are otherwise normal. (See Fig. 1.)

March 10, 1915. I advised the patient to consult Dr. de Schweinitz, informing him that I regarded the neoplasm as a sarcoma. I had never seen a choroidal sarcoma in a patient as young as this patient, and I was not willing to enucleate without having the diagnosis corroborated.

On March 12, 1915, Dr. de Schweinitz wrote as follows: "I am not at all

sure, or perhaps I should say not quite sure, that the lesion is a sarcoma. Naturally, the first diagnosis, as you point out, would be leucosarcoma, but I have seen, and doubtless you have, for I think you have studied the case also, one patient with a very similar looking lesion, under the care of Randolph, with a diagnosis made over and over again of leucosarcoma, which was certainly inaccurate, as years have gone by, and there never has been any development of the condition of affairs.

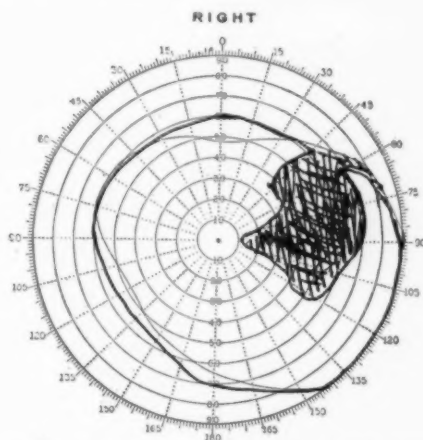


Fig. 1. Field of vision, Case I, March, 8th, 1918.

To be sure, it might be a tuberculous process, in which case the condition would be equally unfortunate for the young woman; but I cannot divest myself of the opinion that it may be some other pathologic lesion, a very unusual form of exudation perhaps with cyst formation. To put it in other words, if this patient were under my care, I would state with frankness the possibility of other processes being present, and that in these circumstances it would seem to me justifiable, for a time to keep the case under observation. I do not believe, even if it proves to be a sarcoma, that such a course, now usually called watchful waiting, is unjustifiable." He suggested a trial with radium.

Doctor Louis P. Hamburger, who had the case under observation for several years, was consulted, and it was agreed to have a subcutaneous tuber-

culin test made. She was admitted into the hospital for this purpose; the test was quite negative. The patient was observed carefully, almost daily, and the impression was that the growth was becoming larger. On March 15, 1915, I noted that since last seen, there was an increase of detachment between the papilla and the neoplasm. The detachment reached up to the disc. There was a very small hemorrhagic extravasation on the surface. Where there had at first been fine hemorrhagic points, there was now a mass looking like confluence of a number of these points. On March 25, 1915, the patient consulted Dr. Theobald, from whom I received the following opinion:

"I examined Miss C's eye with interest, and I cannot make anything out of it except an intraocular growth—in all probability a sarcoma. It is, for the most part, so sharply defined that it does not resemble the inflammatory conditions which sometimes lead us into a mistaken diagnosis of tumor. It is true that the tension is rather below than above normal, but this, of course, is sometimes the case with an intraocular growth. It seems to me that the early enucleation is indicated, for much may be gained by this, and as the sight of the eye, in any case, is doomed, there is little or nothing to be lost."

March 25, 1915. The hemorrhagic spot disappeared. The surface could still be seen with +12 D.

Following the suggestion of Dr. de Schweinitz applications of radium were made to the eye. The treatment was made possible thru the kindness of Doctor C. F. Burnam of the Howard A. Kelly Institute. There were several "massive applications." During this period the eye was watched carefully, but it was not evident that it effected any distinct changes. I therefore advised enucleation of the eye, and the operation was performed on April 11, 1915. The eyeball was given to Dr. Standish McCleary, Professor of Pathology at the University of Maryland. It is proper to mention that when a preliminary report was received from Dr. McCleary on April 20th, I arranged to have a Wassermann test made; for

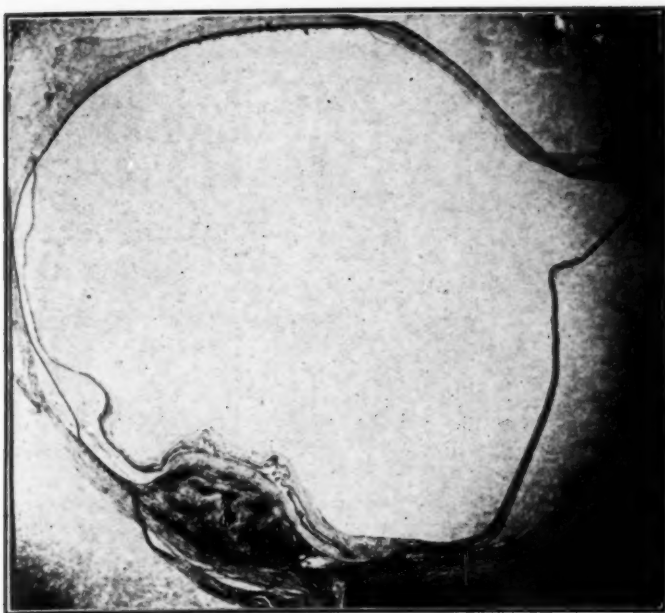
various reasons this had been regarded as unnecessary before the operation. The result of the test was received a few days later as "doubtful." Dr. Charles E. Simon advised that mercury be given for one week, when a second Wassermann was made, which was absolutely negative. (May 5, '15.) Dr. McCleary reported:

"There is an elliptical mass of tissue on the nasal side of the disc, on the plane of the optic nerve, 0.5 cm. by 0.75 cm., projecting into the interior of the eye. This mass is internal to the choroid and has pushed the retina away from that tunic, causing a destruction of the pigment layer of the retina over the summit of the growth. Under low magnification, the tissue mass is seen to be made up of a number of smaller nodules, each having a distinctly zonal arrangement of its component parts. Two of these nodules are degenerated at the center. The tissue is poorly supplied with blood vessels. Several giant cells of the foreign body type can be seen. The picture is typically that of an infectious granuloma; tuberculosis or syphilis. For examination with higher objectives, sections were also stained to demonstrate tubercle bacillus and *Treponema pallidum*. Most careful search failed to disclose the presence of either organism.

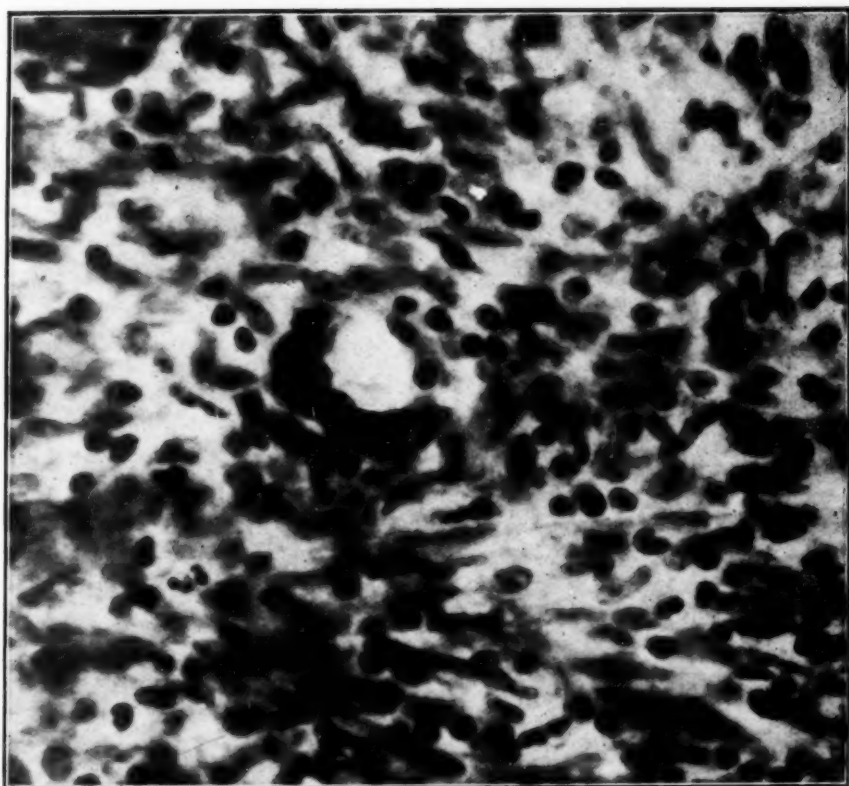
"Under high magnification, the nodules consist of lymphocytes, endothelial leucocytes, plasma cells and a reticulum of fibroblasts and collagen fibrils. A few chromatophores are present in the portion nearest the choroid.

"Two of the component nodules of the mass show areas of necrosis, with typical karyorhexis and caseation. That portion of the growth nearest the retina shows a much more advanced development of the fibrous tissue and here the pigment layer of the retina has disappeared. There is an exudate separating the pigmented and neuroepithelial layers of the retina at each extremity of the growth.

"This exudate is composed of serum in which are lymphocytes and endothelial leucocytes. The structure and arrangement of the mass is characteris-



SECTION OF EYEBALL, CASE I, SHOWING TUMOR AT MARGIN
OF OPTIC DISC



PART OF ABOVE MASS UNDER HIGH POWER SHOWING
GIANT CELL IN CENTER

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1875

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tically inflammatory and nowhere is there the slightest suggestion of true tumor structure. With the von Pirquet and Wassermann tests both negative, and the failure to find either the tubercle bacillus or treponema pallidum in the sections, one is not justified in calling the growth either tuberculous or syphilitic, yet the structure is such that one of the two is guilty if not proven."

I submitted sections to Dr. Verhoeff who very kindly gave me the following statement, "that the tumor is in all probability a solitary tubercle of the choroid. If you will stain a large number of sections differentially you ought to be able to find some tubercle bacilli in them." (This was done without result.)

Dr. de Schweinitz, to whom I had likewise sent sections, submitted them to Professor Allen Smith of the University of Pennsylvania, who made the following report, which Dr. de Schweinitz had the kindness to send me:

"Section of eye shows as the important lesion a small mass developed from the choroid close to the nerve. This, which at first glance strongly suggests a diagnosis of sarcoma, is apparently entirely inflammatory. In the section examined there is a central focus of more or less fragmented polynuclear leucocytes with a developing fibroblastic wall about it. At one point the pus has apparently broken thru the latter and a secondary suppurating focus is developing at the margin of the first. Lateral to these (one on each side in the section) are two fairly defined cellular divisions of the mass, in one of which a smaller but recognizable center of suppuration is forming. All these are enveloped in a mass of round and spindle cells, some of which near the choroidal base of the growth, are pigmented; some are ordinary young connective tissue cells, some from their size and the vesicular type of their nuclei of endothelial origin, some of the type of small mononuclear leucocytes; and close to the necrotic and suppurative centers there is more or less definite polynuclear leuco-

cytic infiltration. The mass is not well vascularized but at places angioblasts are evident, and the small choroidal vessels at the base of the growth show distinct enlargement of their endothelial cells.

"I have hesitated somewhat in concluding as to the suppurating character of the central foci mentioned; but have insufficient basis to conclude otherwise, altho the material in its staining shows too much chromatin material preserved to be entirely typical. I do not, however, hesitate to distinguish the process as inflammatory rather than neoplastic."

Since the eye was enucleated the patient has been progressing fairly satisfactorily so far as her general health is concerned, tho she still complains of frequent and at times severe headaches.

In reviewing the case just described, a number of features should be discussed. The diagnosis of choroidal sarcoma in a patient of 18 years must arouse suspicion. Still we must bear in mind that Kerschbaumer¹ in her work on sarcoma of the eye, in which she reported on sixty-seven cases, found two cases in children, and several cases in persons under thirty.

[The three cases under 20 years of age are the following: Case 12, a child not over one year of age with epibulbar melanosis; case 27, a male aged 3, with angiosarcoma of choroid and case 20, a girl of 16 with spindle cell sarcoma arising in the ciliary body and invading the choroid.]

Syphilitic growths within the eyeball are of very rare occurrence, if we are to judge from the published accounts. I have been able to find only the following references:

According to Baas² true gumma of the choroid had been established in only a single case, in that of Schoebl; and there were no true cases of retinal gummata that had been definitely proved, tho there were clinical observations.

Parsons³ says: "True gummata of the choroid characterized by necrosis are of extreme rarity. . . . Only gummatus infiltration has hitherto been observed."

Groenouw⁴ states that gummata of the choroid and the retina are very rare; they have the appearance of prominent white masses which arise in the choroid and invade the retina secondarily; they are usually accompanied by iritis, optic neuritis, retinal hemorrhages and bulging of the sclera.^{5*} It is evident that this picture is quite different from that described in the case reported.

Lawson⁶ reported a large elevated mass at margin of disc containing cholesterol crystals, with extensive choroidoretinitis. The case was probably one of the group of Retinitis with Massive Exudate.

Alexander⁸ records the case of a male aged 42, who had pronounced luetic symptoms. The right eye was badly affected with vitreous opacities; and after these had cleared up, two elevations could be seen. They were evidently very small, not reaching more than 1 mm. or 1½ mm. into the interior. They disappeared under continued antisyphilitic treatment.

Hirschberg¹⁰ describes two cases; both were severe forms of lues. In both there were large, prominent, rapidly enlarging choroidal masses, producing intense vitreous opacities. The optic nerve was very congested.

Gutmann¹¹ found an oval neoplasm near the macula with hemorrhages in the retina round about, and a paracentral scotoma.

Alt¹² reported cases probably cured.

Hanssen¹³ reported a case reviewed in *The Ophthalmic Year Book*, v. 13, p. 140.

The possibility that the growth was a conglomerate tubercle must also be considered. This condition is likewise exceedingly rare. It is commonly associated with other manifestations of tuberculosis. Such tumors have been generally described as whitish or yellowish white in appearance; in a few instances this has led to the enucleation of the eye-ball under the diagnosis of glioma.

Spalding¹⁴ removed an eye because of supposed glioma and found conglomerate tubercle on pathologic examination. Natanson¹⁵ reports two cases of

conglomerate tubercle in early childhood in one of which the diagnosis was glioma. Salzmann¹⁶ in 1911 reported a similar error in diagnosis.

In the neighborhood of the tuberculous neoplasm there have usually been small miliary deposits. Finally these tumors are ordinarily complicated by signs of inflammation of the conjunctiva, cornea or iris. It is true that a few cases have been recorded in which there has been complete absence of such complications; as in the cases noted by Natanson: Rogman, Solomon, Emanuel and Dupuy-Dutemps and his own. Parsons suggests that a solitary tubercle of the choroid may also simulate a choroidal sarcoma. It is evident that there are cases in which the correct diagnosis can be made only by pathologic examination.

For discussion of conglomerate tubercle of choroid see Groenouw,¹⁷ Parsons,¹⁸ and Lubarsch-Ostertag.¹⁹

We cannot exclude a tubercular origin of the growth, altho tubercle bacilli have not been found, in spite of the most careful examinations by competent pathologists. In view of the foregoing, I believe that we are justified only in describing the case as a **granuloma of the choroid** of obscure origin. Such a case was described by Frank O. Thomas and George Coates²⁰ under the title "Peculiar Granuloma of the Retina." The case showed a large retinal growth with marked optic neuritis; the trouble followed upon an attack of influenza. The growth was examined pathologically and found to be a large granuloma coming from the retina.

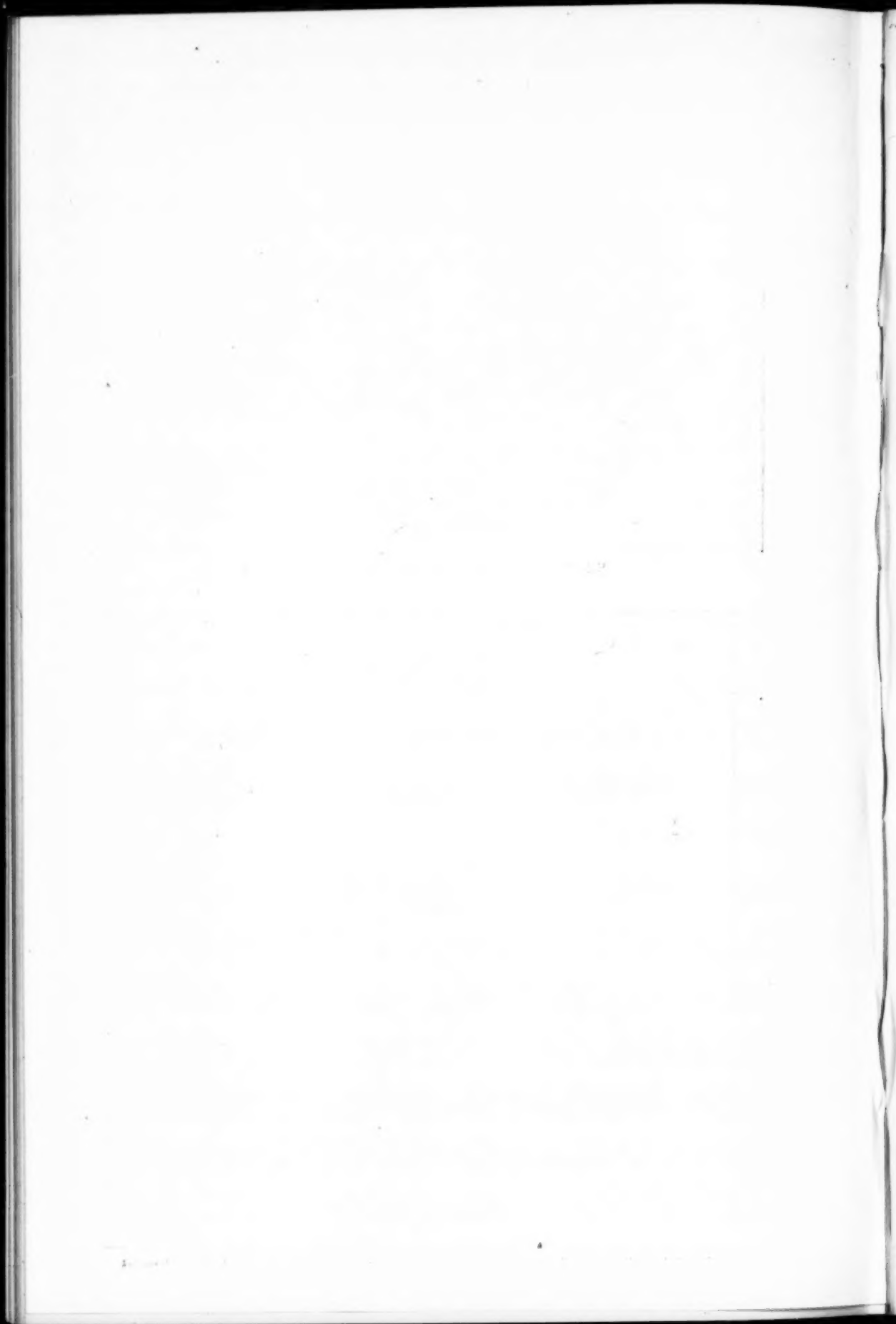
CASE 2.—Charles F., aged 12, was first seen on November 16, 1917. The sight of the right eye had been lost, but no definite history could be elicited. The fundus of the right eye showed intense dilatation of the arteries and veins, both of which were exceedingly tortuous, especially in the temporal half of the retina. In the temporal periphery there was a large neoplasm, rounded, projecting far into the vitreous (its surface could be seen with +17D). It was pinkish in appearance



SECTION OF TUMOR, CASE I, UNDER LOW POWER



CASE II. SECTION OF ORGANIZED INFLAMMATORY EXUDATE UNDER HIGH POWER



and on its surface large convoluted vessels were conspicuous. The optic disc was blurred in outline and presented the picture of a moderate neuritis. There were numerous small white effusions on the nasal side of the disc; somewhat larger ones, arranged in rows, studding the entire macular region. There were also small white exudates in the lower portion of the retina. In the lower periphery one large blood vessel was converted entirely into a white branching streak, accompanied by the white spots just described. In the lower outer field there was a small area of flat detachment.

Transillumination, contrary to my expectation, gave no shadow. The ophthalmoscopic picture was very difficult to interpret. The growth had all the appearance of a choroidal sarcoma. But the presence of the large masses of blood vessels on its surface, and especially the exceedingly high degree of dilatation of the retinal blood vessels (which were increased in breadth to 4 and 5 times the caliber of the vessels in the fellow eye) were very anomalous.

A careful clinical examination at the hands of Dr. Louis P. Hamburger showed that the boy was otherwise quite healthy. Dr. Sydney R. Miller examined the blood and urine with negative results; a Wasserman test and a von Pirquet reaction were both likewise negatives. These results excluded a luetic affection or a solitary tubercle. The condition of marked dilatation of the bloodvessels and the presence of evident disease in the retinal bloodvessels together with the scattered white exudates in the retina, suggested the possibility that the case belonged to the class first described by Coates under the title "Forms of Retinal Disease with Massive Exudation." In cases of this kind, which I described in a paper read before the Am. Oph. Soc. in 1914, I was much impressed by the prominent tumor-like masses which they at times present, as well as by the marked disease of the retinal vessels.

The patient was seen by several col-

leagues who concurred in the probably malignant nature of the neoplasm, and who agreed in the advice that the eye should be enucleated. This operation was performed December 6th, at the Woman's Hospital. The eye-ball was placed in the hands of Dr. Standish McCleary for pathologic investigation. His report is as follows

"After formaldehyde fixation a section through the equator of the eye shows a mass $0.9\text{cm} \times 0.6\text{cm}$ projecting into the posterior chamber.

"Under low power magnification this mass is very vascular, the vessels both in size and number are excessive. A recent hemorrhage covers the surface of the mass at one point. There is also diffuse hemorrhage.

"Higher magnification shows that the vessels are in various stages of development, some forming and others fully developed. Several of the smaller ones contain hyaline thrombi. The tissue is very cellular and consists chiefly of what is termed "round cell exudate," comprising lymphocytes, a few plasma cells, polynuclear leucocytes and large mononuclear cells. Scattered among this cell complex are numerous fibroblasts and collagen fibrils. The organization of the exudate is more advanced in other places, showing strands of fibrous tissue. Between the pigmented epithelial layer of the retina and the choroid for a distance equal to one-half the length of the mass, there is a serous exudate containing a few leucocytes, lymphocytes and pigmented cells.

"There is nothing in any part of the mass to suggest a neoplasm and the picture is typically that of an inflammatory exudate undergoing organization."

Dr. McCleary regarded the case as one of "Retinitis with Massive Exudation."

The two cases described in this paper indicate the difficulty, or even the impossibility, or making a definite diagnosis in some cases of neoplasm of the fundus, solely on the ophthalmoscopic appearances.

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REPORT OF TWO ORBITAL TUMORS.

A. EDWARD DAVIS, M. D.

NEW YORK.

These cases, one of endothelioma of orbit and frontal bone, and one of myxoglioma of optic nerve and orbit, were reported to the American Ophthalmological Society, July 10, 1918.

CASE 1.—Endothelioma Affecting the Orbit and Frontal Bone.—Mr. C. C., aged nineteen years. Family history negative; is robust—in fact, a football player. Consulted me December 21, 1917, because of swelling of the lids and prominence of the right eye, the swelling extending from the eyebrow to the hair, circular in shape, of an elevation one-half inch, and of bony hardness; no pain; temperature and pulse normal. Patient thinks the swelling on the right side of the forehead may have resulted from injury while playing football, although the skin surface was never broken. V. R. E.=20/30; L. E.=20/20, not improved; J1, 6 to 18 inches each. Slight swelling of nerve-head in right, with the veins slightly enlarged; fundus normal otherwise. Tn. Blind spot normal in size, also the fields and pupils. Slight restriction in movement of the eye upward and outward, and double vision obtained when he looks far up and outward.

January 4, 1916: Thru an incision

one and one-half inches long, just below the upper rim of the orbit, the lacrimal gland and part of the roof of the orbit were removed. Pathologic examination of the specimen showed it to be an endothelioma. One week later the roof of the orbit and 1½ inches of the frontal bone to the hair on the forehead, together with the meninges, extending itself into the brain tissue, were removed. The patient made a good recovery, so far without return of the trouble. After the wound had firmly healed the patient has been and is now under X-ray treatment at week intervals.

Present condition: The patient is in perfect health and at his work as a clerk, and feels no ill effects from his operations. There is no sign of brain hernia, the right side of the forehead being on a level with but not protruding beyond the left, the symmetry of the two sides being remarkable. The advisability of a bone-graft has been considered, but, as the opening in the

skull is so large, it has been questioned if so large a space could be successfully bridged over by this method of procedure; so far only a protective cap has been used. There is slight ptosis present, and all the external muscles of the eye are inactive save the obliques, both of which function. There is a divergence of 20 degrees. The pupil is normal in size and reaction, and the accommodation the same as in the sound eye. Vision in each eye is same as before operation; simple binocular vision is absent. The fields are normal. No attempt has as yet been made to remedy the ptosis or place the eye in a straight position, and will not until the X-ray treatment is completed, and a return of the growth considered unlikely.

As to the pathogenesis of endotheliomata, Parsons states that "The exact nature of endotheliomata and their exact position amongst the sarcomata have not been settled." He himself classifies them as fibrosarcomata. The prognosis in such cases is rather favorable, as they are not nearly so malignant as the round-cell type of sarcoma.

(Pathology of the Eye, vol. ii, p. 707.)

CASE 2.—Myxoglioma of the Optic Nerve and Orbit, Intradural, being the recurrence of a Spindle-celled Sarcoma (?), Intradural, removed seven years previously by the Krönlein Method.—The previous history of this patient has been kindly furnished to me by Dr. Julius Wolf, of this city, and is herewith given:

"November 20, 1910: R. D., aged eight years, no history of previous illness; the third of healthy children. Three weeks ago the left eye began to look strange to the parents and teacher, and since then the eye has been steadily growing worse. At present it shows a well-marked exophthalmos directly forward; yesterday there was no convergence; today the left eye is markedly convergent, the corneal margin being behind the caruncle. The pupils react normally. The outward movement of the eye extends to within 2 mm. of the external canthus. The ophthalmoscope shows a marked choked disc in the left eye. Both eyes are hyper-

opic about 4 D. with some astigmatism. The lacrimal gland cannot be felt. There is a decided feeling of resiliency of the left eyeball when pushed into the orbit.

"November 21st: The internal strabismus has disappeared; the exophthalmos has not changed any.

"November 23d: Convergence present again; V. L. E. = 15/50, disc still choked. X-ray by Dr. Caldwell shows blurring in the ethmoid reaching to the orbit. Diagnosis: tumor of the orbit. Operated by the Krönlein method, and removed part of the optic nerve, which had a spindle-shaped tumor inside the optic nerve sheath, about one inch long by three-fourths in thickness at center. On examination of the tumor a diagnosis of spindle-celled sarcoma was made."

This girl first came under my care at the Post-Graduate Hospital six months after the operation by Dr. Wolf. The condition found was convergence of the left eye 30 degrees, due to section of the external rectus muscle; V. = O; postneuritic atrophy of the optic nerve; pupil normal in size and reacted consensually. There was a discharging sinus at the lower end of the Krönlein incision, which had healed except at this point; patient was in good health, and there was no sign of metastases.

The fistulous opening was enlarged, some dead bone removed, followed by immediate healing. The patient remained well until the spring of 1918, having been under observation by myself every few months all this time—about seven years. During March of this year the patient noticed that the eye was again becoming prominent. The eye is now displaced $4\frac{1}{2}$ mm. forward and slightly inward. No pain is complained of. The ophthalmoscope shows a white optic disc, but no inflammatory symptoms in the fundus. Pupil normal in size and to consensual reaction. X-ray shows the apex of the orbit up to the eyeball filled with a growth. Because of the recurrence, a complete exenteration of the orbit was advised.

On June 13th, under ether narcosis, Dr. Hubbard, my chief of clinic, performed a complete exenteration, first enucleating the eyeball, then removing the entire orbital contents, including periosteum. The optic nerve could be seen both at the anterior portion and the posterior portion of the tumor, so it is evident that not all the optic nerve was removed at the first operation; in fact, the retinal circulation was maintained in the eye up until the time of the second operation.

The pathologic examination of the tumor is as follows:

MACROSCOPIC.—The eyeball has increased tension. The pupil measures 2 mm. The iris is white and thickened. On section the lens is much flattened and has an opaque, greenish-yellow nucleus. The vitreous is fairly normal. The retina is transparent, and the choroid shows loss of pigment, especially at the equator. There seems to be linear radial thickening near the papilla. The capsule of Tenon is hemorrhagic, and the optic nerve is enlarged to 2.5 cm. in diameter for a distance of 4 cm. behind the bulb. This tumor is resilient, and its cut surface seems to show a hypertrophy of the optic nerve, somewhat soft and degenerating. The growth is surrounded by muscles, gland, and fat.

MICROSCOPIC.—Cross-section of tumor of optic nerve reveals a picture entirely of neuroglia cells and fibrils. All nerve-fiber elements have disappeared, and their place is filled with myxoid material thru which the neuroglia tissue is intertwined with scant remnants of the old connective-tissue septæ. Irregular hyalin bodies are frequent, and an occasional amyloid concretion. The sheath is not remarkable.

DIAGNOSIS.—Myxoglioma.

Parsons states that the term "glioma" has been used loosely for any connective growth occurring in nervous structures, and cannot be considered authentic unless the growth is proved to consist essentially of a neuroglial hyperplasia by the successful application of specific neuroglial stains.

[Parsons: Pathology of the eye, p. 699.]

I may say that, besides Dr. Meeker, of the Post-Graduate Laboratory, Professor Ewen, of Cornell, has examined some of the sections of this tumor, and has pronounced it myxoglioma. The variety and rarity of such intradural growth certainly make it worth while for report. That a glioma should succeed a sarcoma, if the first growth was a sarcoma, is also of interest.

TUMOR OF THE ORBIT, WITH EXTENSION TO FRONTAL AND TEMPORAL REGIONS, TREATED BY X-RAYS.

WILLIAM M. SWEET, M. D.

PHILADELPHIA.

This case, showing the beneficial effects of Roentgen ray treatment, was reported to the American Ophthalmological Society, July 10, 1918.

The following history of a case of orbital tumor does not differ in its essential features from the usual type of these growths. The case is reported as an evidence of the value of the Roentgen rays in controlling the disease for several years, as shown by the bone regeneration that followed the treatment:

S. H., aged twenty-six years, first

noticed swelling of the eyelids of the right side two years prior to the date of examination, May, 1908. In a few months the sight of the right eye began to fail, and there was slight protrusion of the globe. There was no pain, and the symptoms remained unchanged until six months ago, since which time the prominence of the eye increased. Well-developed, robust,

healthy individual, with normal urinary and blood tests, and with no family history of malignant disease. No history of injury. Right eyeball turned down and slightly outward, and protruding 8 mm. beyond the level of the left eye. Outward rotation impaired, but fair rotation in other directions. Palpation showed a hardened mass above eyeball, extending from near the inner canthus to slightly beyond center of orbital margin. Pressure failed to relieve the exophthalmus. The right pupil was 4.5 mm., reacted sluggishly, the left 3.5 mm., reacted freely. The left eye was normal in all respects. The optic disc of the right eye was pale, the veins full and tortuous, particularly the smaller twigs, and the arteries reduced in caliber. Visual fields contracted on temporal side.

Following a request of the patient to endeavor to save the eyeball, an incision was made thru the brow, the orbital fascia separated, and the finger passed into the orbit. A dense, hard mass was found attached to the upper and inner orbital wall, not connected to the eyeball or optic nerve, but extending some distance beyond the globe. In order to remove the mass the eyeball was enucleated, an incision made thru the external canthus, and complete extirpation of the orbital tissues made.

After separating the periosteum with the tumor it was found that the disease had attacked the bone in the upper nasal portion of the orbit, and there was an opening large enough to admit the finger thru the bone and

dura. The orbit was packed, and healing was uneventful. X-ray treatment of the orbit was given by Dr. W. F. Manges, of Philadelphia, and continued later by Dr. George C. Johnston, of Pittsburgh, in which latter city the patient was in business.

Three years after the operation swelling was noticed of the frontal bone, particularly in the outer portion. The X-ray treatment was directed to this region, and later also to the temporal bone, which showed enlargement. These measures held the disease in check, and enabled the man to continue his work. A set of stereoscopic X-ray plates showed the right frontal sinus completely occluded by the disease, with extensive involvement of the frontal and temporal bones. These plates indicated, as reported by Dr. Manges, that healing was in progress in the frontal region, the process being one of bone regeneration, but in the temporal region there was not the same evidence of bone reproduction, indicating activity of the disease in this situation. The X-ray treatments were given every four weeks, the full therapeutic dose being administered for five minutes in different directions to reach the diseased areas.

Late in 1916 the man died. Until three days preceding death he was comparatively comfortable. He then had intense headache, followed by delirium. No postmortem examination was permitted. The tumor was shown to be an endothelioma.

TRANSIENT LEFT HOMONYMOUS HEMIANOPSIA.

HENRY H. TYSON, M. D., F. A. C. S.

NEW YORK.

Report of a case probably toxic and of angioneurotic origin, recovering from first attack with a recurrence, leaving quadrant achromatopsia.

On March 27, 1911, Mr. M. C., aged twenty-eight years, banker, was referred to me by his physician, on account of blurred vision on his left side. He gave a history of awakening on the morning of March 24 after a cham-

pagne spree, with a severe headache, located on the right side of his head, extending from the occiput to and around his right eye. The pain in his head remained until the next day, when he noticed that his vision was in-

distinct on his left side, and had remained so until the date of his examination.

For the relief of his headache he had taken, by order of his physician, acetanilid grains eight, and novospirin grains forty, during the twenty-four hours. During the forty-eight hours preceding the loss of vision, according to his statement, he had imbibed four quarts of champagne and numerous other alcoholic beverages, viz.: silver fizzes, cocktails, etc. He had been accustomed to smoking from thirty to forty cigarettes daily. He gave an early history of occasional attacks of

tion and consensually normal. Fields of vision show incomplete left homonymous hemianopsia, with form field contracted to within eight degrees of fixation on horizontal meridian (vide chart No. 1). The color fields were contracted to fixation in similar fields as per chart No. 2. Eye backgrounds normal, except that the retinal veins were a trifle darker than normal.

Pulse 76. Blood pressure 138. Blood examination by Dr. Sondern R. B. C., 5,030,000; W. B. C., 9,000; hemoglobin, 68 per cent. Differential count, relative lymphocytosis. Urinalysis, Sp. gr. 1015, acidosis, low urea, no albumin,

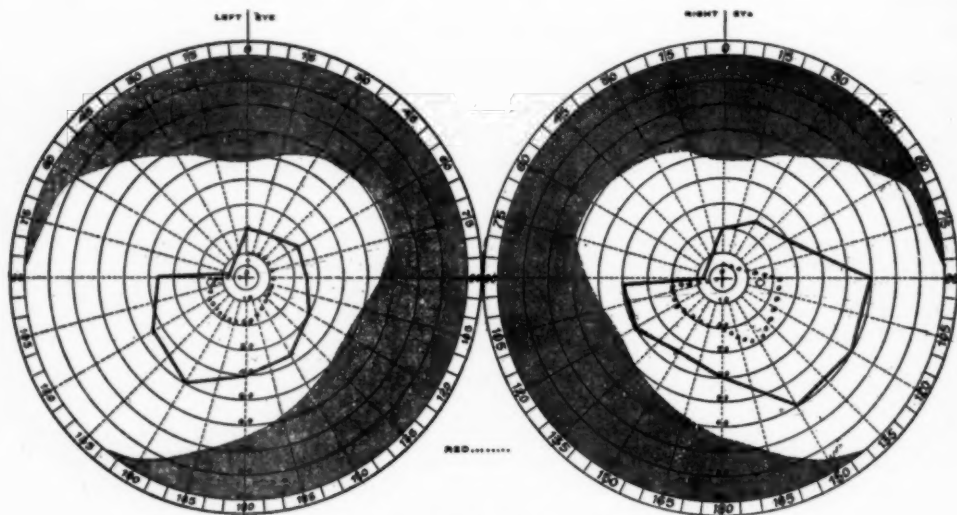


Fig. 1. Chart of visual field during transient hemianopsia.

migraine, commencing when he was eight years of age; and at times numbness of his hands would accompany them. They ceased at age of twenty-three. During 1903 Dr. R. F. Weir removed a tumor from his thigh, and the pathologist pronounced it a traumatic sarcoma. Syphilis negative—had gonorrhea during 1905. Tuberculosis, teeth and sinuses negative.

Examination of eyes—March 27, 1911. Vision, R. 20/15, L. 20/15, with correction plus 0.25—plus 0.25 cyl. 90° equals 20/10 both. Muscles, orthophoria. Tension normal. Sensibility of corneas normal. Pupils 2½ mm. each. Reaction to light, accommoda-

tion and consensually normal. Fields of vision show incomplete left homonymous hemianopsia, with form field contracted to within eight degrees of fixation on horizontal meridian (vide chart No. 1). The color fields were contracted to fixation in similar fields as per chart No. 2. Eye backgrounds normal, except that the retinal veins were a trifle darker than normal.

Pulse 76. Blood pressure 138. Blood examination by Dr. Sondern R. B. C., 5,030,000; W. B. C., 9,000; hemoglobin, 68 per cent. Differential count, relative lymphocytosis. Urinalysis, Sp. gr. 1015, acidosis, low urea, no albumin, no sugar, no excess indican, (faulty metabolism). No symptoms indicating any other nerve lesion.

Eliminatives and light diet, with avoidance of alcohol and tobacco, were ordered, and nine days later, color and form fields were quite normal. On December 7, 1911, he called again for examination. Vision, R. 20/20, L. 20/20. He stated that ten days previously he had a "bilious headache" after another spree, and that his vision was again blurred; but had not cleared up like the attack in March. He had been drinking large quantities of champagne and other alcoholic beverages during the past month, and had also been

smoking his usual number of cigarettes, about forty daily. Examination of visual fields showed left homonymous superior quadrant anopsia, incomplete; the apex of the angle extending to within five degrees of fixation for form, while that for colors was contracted to fixation. The right fields were contracted about twenty-five degrees from fixation. Eye backgrounds, disks slight pallor with edema, retinal veins dilated and tortuous, arteries slightly contracted. On December 20 his form fields had widened to within ten degrees of normal, while his color fields remained contracted in left su-

perior quadrants to about fixation, constituting a left homonymous superior quadrant achromatopsia.

Among others Peter² reported a case of left homonymous hemianopsia associated with migraine, and Posey³ also reported a case with left fields somewhat similar to mine, excepting that it was right homonymous hemianopsia, and was permanent. As to the localization of the site of the lesion in these cases we are indebted to Beevor⁴ and Collins for their careful study and report of their case of permanent left superior quadrant anopsia, with clinical, microscopic and autopsy findings, the

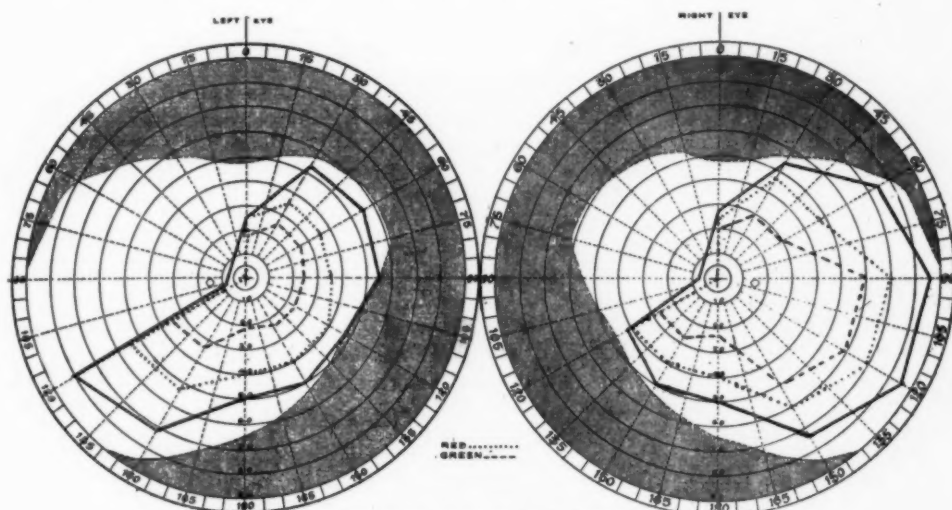


Fig. 2. Chart showing boundaries of color fields during transient hemianopsia.

perior quadrants to about fixation, constituting a left homonymous superior quadrant achromatopsia.

Transient hemianopsia may be found associated with cerebral lues,¹ uremia, lead poisoning, general paralysis, chronic nicotin poisoning and in ocular migraine. After careful consideration of the case just reported, I am of the opinion that it belongs in the class of ocular migraines, and that the previous history of a neoplasm, or the drugs prescribed by his physician for his headache had no influence as causative factors in producing the hemianopsia. I think that the alcohol and the nicotin, especially the former, were

visual fields in which were very similar to those in case under consideration. "They found at autopsy an occlusive lesion of the right posterior calcarine artery which caused destruction of the inferior third of the cuneus, including all the cortex above and below the calcarine fissure, with the exception of a small point anteriorly. Careful microscopic study showed that the lesion was limited entirely to the cortex. They concluded that the lower third including the upper and lower lips of the calcarine fissure, represented the upper visual quadrants, while the upper two-thirds of the cuneus represented the inferior quadrants." In or-

der to account for the production of the transient anopsias in the left superior quadrants in migraine, we would be obliged to postulate a prolonged spasm of the right posterior calcarine artery with a consequent ischemia and possible edema, (angioneurotic edema), with subsequent disappearance of same. The extent of organic changes, if any follow, would depend upon the toxicity of the exciting cause, and the length of time the tissues were de-

prived of their nutrition on account of the disturbed circulation.

The interesting features of the case are: 1. The transitory nature of the first attack which persisted nine days with restoration of visual fields, and the recurrence eight months later with recovery in form field but permanent left homonymous superior quadrant achromatopsia remaining.

2. The fact that alcohol and tobacco were probably the exciting cause of the cerebral angioneurosis.

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ALTERATIONS IN THE VISUAL FIELDS ASSOCIATED WITH PELLAGRA.

F. PHINIZY CALHOUN, M. D.

ATLANTA, GA.

A summary of observations and reports of cases, presented to the Section on Ophthalmology of the American Medical Association, June 14, 1918.

For nearly two centuries that disease which is commonly called pellagra has attracted the attention of the medical profession of southern Europe, but only within the last decade, when its prevalence in America assumed alarming proportions and it began spreading with startling rapidity, have we given it serious thought. Today, in the South especially, where the disease is widespread, there is no malady which is receiving more attention from scientific and economic minds.

The history of the disease is attractive, and the literature of the subject is voluminous. It is therefore an easy task for one interested in the general subject to find ready references in any well equipped medical library.

I have previously recorded¹ certain alterations of the visual fields occurring in individuals affected with pellagra, and I wish to attach those cases, and certain excerpts from that report, to this communication in order to make it complete.

It may not be amiss in this connection that I define the disease, and briefly mention the facts regarding its etiology and symptomatology that have been given us by students of pellagra. Roberts² very tersely says that "pellagra is an endemic and epidemic disease, periodic and progressive in its course, and characterized by a series of symptoms involving chiefly the digestive, cutaneous and nervous systems." Its cause is usually regarded as unknown, yet many theories have been advanced, none of which have stood the test of time. The two that have been most prominent are (1) the intoxication theory, or that pellagra is caused from spoiled maize, and (2) the infectious theory, or that pellagra is an infectious disease caused by the presence of a parasite in the human body which is probably conveyed by an insect of some kind. The former has always been the most generally accepted, until in 1915, Goldberger, after considering the striking relation of pel-

lagra to poverty, conducted an experimental study on men previously free from pellagra at the farm of the Mississippi State Penitentiary. By an offer of pardon from the governor of the state, eleven volunteers were obtained, and a like number of other convicts were used as controls. Those used in the experiment were fed on special diet (chiefly carbohydrates) consisting of flour, meal, grits, rice, sugar, syrup, potatoes (sweet), fat pork, collards, cabbage, turnip greens and coffee; the controls were given the usual prison food which included animal proteins and legumes. All of the men performed the same character of work, but the two squads were separated. After about six months, at least six of the eleven volunteers developed symptoms of pellagra, including a typical dermatitis; loss of weight and strength, and mild nervous symptoms appeared early, yet gastro-intestinal signs were slight. Goldberger concluded from this study that pellagra had been brought about by a one-sided diet, and he seemed justified in concluding that pellagra was of dietary origin.

The symptoms of the disease are likewise varied and uncertain, but there are certain signs that are usually sought for in arriving at a diagnosis, such as catarrhal disturbances of the alimentary tract varying in extent from the mouth to the anus, the nervous and mental phenomena, and chiefly the cutaneous symptoms—a dermatitis. Ocular changes occurring in pellagra have long been noted. Pathologic changes in the nerve head have been frequently noted by Rampoldi,⁴ Whaley,⁵ Ottolenghi,⁶ Giuta⁷ and others, while Procopui⁸ calls attention to the frequency of amblyopia in pellagrins. There have been noted also circulatory disturbances in the retinal vessels, attributable to the toxins derived from the disease. In addition, juvenile cataracts are frequently mentioned (Tucker,⁹ Procopui,⁸ Fabricus,⁶ Whaley⁵ and Marie¹⁰) and are considered quite prevalent.

Calderini¹¹ reported that 48 per cent of men and 72 per cent of women complained of disturbance of vision, such

as amblyopia or diplopia. Ottolenghi noted a papillitis, and in one case the visual field was more restricted in the left eye than the right. In another case he noted "a grave atrophy of the disc." Bietti¹² likewise reported an atrophy of the disc, and he regarded an amblyopia ranging from 20/30 to 20/70 as very common. Visual fields were normal in fifty-five patients examined. Microscopic sections of the nerve and retina, which were stained by the method of Nissl, Marchi and Pal, were negative.

The more recent clinical studies of pellagra made by Ridlon¹³ are of interest in this connection. His report is based on the observation of fifty-eight patients suffering from pellagra, who were treated in the United States Marine Hospital, Savannah, Ga. Only those patients were admitted who were found free of tuberculosis, syphilis, or any affection of the heart, kidneys or lungs. In summarizing the symptoms, he states that dimness of vision was present in 34 per cent of the cases. These patients often described this as "the presence of a skim or haziness before the eyes." Also dimness of vision was the first symptom making its appearance in three cases. Unfortunately, no report is made of the ocular findings or visual fields, if any were made, in these cases.

Harris¹⁴ likewise mentions disturbances of vision in a fatal case of pellagra.

I have made careful fundus examinations in about fifty cases, the majority of these patients not being active pellagrins. The only picture in the very active or seriously ill patients that was divergent from the normal fundus was the decided pallor to the optic discs. Only once did I notice the extremely dilated pupil, so frequently recorded by other observers.

My attention was first directed to an alteration in the visual field with a scotoma in Case 1. Other investigations followed which now lead me to believe that a contraction for form and color takes place in the majority of the cases of pellagra, and that in a relatively large proportion of cases there is

a relative or an absolute central scotoma for colors.

I was not aware that alterations in the visual fields of pellagrins had before been recorded, although Whaley must have attempted such a study, since he writes that "all pellagrins are unresponsive and no field examination could be made." I likewise found, as has been recorded, that Calderini mentioned a contracted field in one case, and in fifty-five patients examined by Bietti all fields were normal. It is proper to mention in this connection that in those cases which showed a scotoma a thoro physical examination and blood Wassermann was made, and

perintendent and medical staff of the Georgia State Sanitarium for the insane at Milledgeville, I visited the institution, where, out of the several hundred of pellagrous inmates, about fifty were selected for the examination. Yet out of that number I was able to examine satisfactorily only about fifteen patients on account of the lack of co-operation and the deranged mental condition of the patients. Later, thru the hearty coöperation of several of my local confrères, I satisfactorily examined many of their private patients. In many instances it was necessary to repeat the examination or even train the patient. I used the ordinary perim-

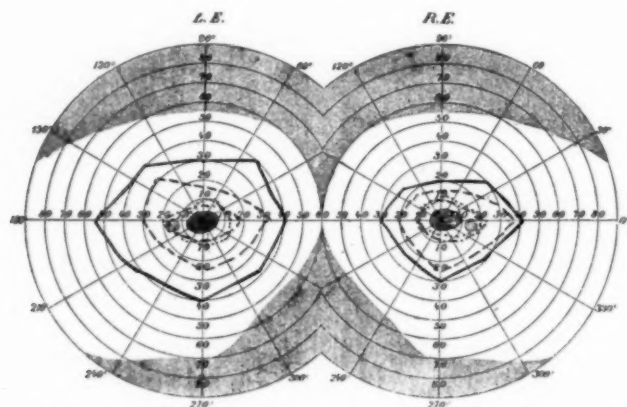


Fig 1. (Case 1, Oct. 23, 1915).—A contraction of the form and color fields, with a slight interlacing of the greens and reds. In the right field there is an absolute scotoma for red, and a relative scotoma for green. In the left field there is an absolute scotoma for red and green, and a relative scotoma for blue.

all other conditions that would have been likely to produce this picture were eliminated. When there were contributory causes associated with pellagra, such as the habitual use of tobacco, alcohol or morphin, these cases were grouped, as the diagnosis might be properly questioned.

This investigation was first begun in the medical ward of Grady Hospital, and in the out-patient department of Emory University School of Medicine, where there are at all times many cases of active and quiet pellagra. After a few attempts in taking the fields of vision of these patients, especially among the negroes, I abandoned the task as hopeless. Thru the kindness of the su-

per of 33 cm. radius and Schweigger's 1 centimeter test objects in taking the fields and Peter's hand campimeter in mapping out the central areas.

REPORT OF CASES.

CASE 1.—*History*.—Mrs. J. B. M., white, aged 46, housewife, consulted me April 8, 1915, on account of defective vision of two months' duration. There was nothing of importance in the family history. She had enjoyed good health, except for joint pains which she termed "rheumatism." She complained of indigestion and constipation. She had been married twenty-one years and had had six pregnancies, of which the first three were miscarriages. She had

not menstruated for four months. She had not complained of sore mouth and tongue, but had extreme nervousness. She did not know that the skin on the dorsal surface of the hands and forearms was rough and brown. She was not addicted to the use of drugs, whiskey or tobacco. After my examination, in which I found amblyopia with central scotoma, I referred the patient to Dr. Stewart R. Roberts for a general physical examination, who reported nothing abnormal except a mild atypical pellagra. The patient being well developed and presenting none of the pellagra symptoms with which I was familiar at that time (this being my

The left field showed an absolute central scotoma for red and green and a relative scotoma for blue. The blind spots were normal.

Subsequent examinations were made which showed no relative change in the fields, except that the scotomas for all colors had become less absolute. The general health of the patient has improved, her menses have become regular, the mild dermatitis has practically disappeared and she has gained in weight, but there still remains the extreme nervousness.

CASE 2.—*History*.—Dr. R. W. B., white, aged 46, referred by Dr. J. C. Johnson for an eye examination, with

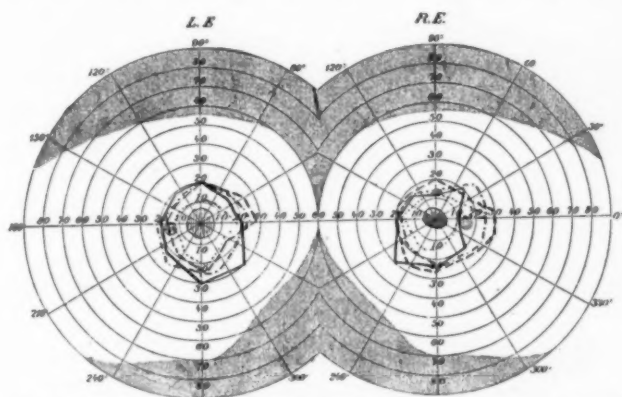


Fig. 2 (Case 2, March 1, 1916).—A field that is greatly contracted for form and color, with a marked interlacing of colors. There are central relative scotomas for red and blue.

first case), I admit that I was somewhat surprised at the diagnosis; but subsequent study of the disease and the associated eye changes convinced me of the positiveness of the diagnosis. The urine and the blood Wassermann were negative. Examination of the nose and sinuses was also negative.

Eye Examination.—Vision, right and left, was 20/100 unimproved. The ocular muscles were normal, the pupils round, equal and reacting to light and accommodation. The fundus showed a decided paleness of the disc in the papillomacular bundle. Tension was normal.

The fields showed a decided contraction for form and colors. In the right eye there was an absolute scotoma for red, and a relative scotoma for green.

negative family history, had been in perfect health until 1901, when he had typhoid fever, and since then his health had been bad. In 1910 he had grip; he was much "run down" in 1913. In August, 1914, he developed a severe attack of "biliousness," and could not eat for want of appetite. He lost 20 pounds in three months, which was regained, but his general condition did not improve. In October, 1915, he lost 30 pounds, and in April an eruption appeared on the hands and wrists, at which time he consulted Dr. Johnson. He had never had diarrhea or sore mouth. He did not use tobacco, and rarely took a drink of whiskey. He denied the habitual use of any drug. A general physical and laboratory examination was made by Dr. Johnson,

who reported nothing definite, except a well defined case of pellagra. The nose and sinuses were negative.

Eye Examination.—Vision, right and left, was 20/15 with correction. The pupils, muscular balance and fundus were normal. The fields showed marked contraction for form and color, with a central relative scotoma for blue and red. The blind spot was normal.

Nov. 24, 1917, there was much improvement in the general symptoms, and the patient had gained in weight. The fields for form, while still contracted, showed a decided improvement. There was a marked interlacing

dilated, but contracted to a strong light. The fundus was normal, except for marked physiologic cupping in the right eye. Tension was normal.

The fields showed marked contraction for form and colors, with a relative scotoma for red and green. From this examination I questioned the patient closely and soon learned that I could not obtain an accurate history from her. But it was definitely determined that she had lost considerable weight within the last few months, and that her present nervous and mental state had alarmed the family. From a picture of the visual fields, pellagra was

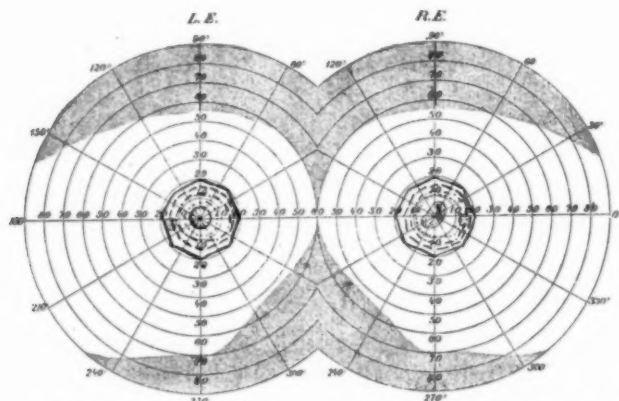


Fig. 3 (Case 3, June 22, 1916).—A marked contraction for form and colors, with relative scotomas for red and blue.

of colors, and in the right eye there was a relative scotoma for colors.

The next case was the most brilliant one of the series, for we were able to suspect the diagnosis of pellagra from the picture of the visual field.

CASE 3.—History.—Mrs. S. C. A., white, aged 26, housewife, of Heflin, Ala., seen June 20, 1916, complained of abdominal pains, a vaginal secretion, backache, headache, loss of weight and general nervousness, and was referred to Dr. W. S. Elkin for a pelvic operation. The examination did not reveal any abnormalities or changes which required surgery, but as the patient complained of headache and pains in the eyes I was asked to examine her.

Eye Examination.—Vision, right and left, was 20/15. The muscular balance was normal; the pupils were widely

considered as a cause; and examining her hands and forearms, I found a roughened and bronzed condition of the skin. Thoro physical examinations were made by two competent internists; one unhesitatingly made the diagnosis of pellagra, and the other would not positively commit himself without knowing the Wassermann reaction, which could not be obtained, although he considered pellagra the most likely diagnosis.

CASE 4.—History.—Mrs. S. A. W., white, aged 38, had had attacks of pellagra for about twelve years. The symptoms were typical of the disease, such as sore tongue and mouth, diarrhea, nervousness and skin manifestations. There had never been any mental derangement. At the time of my

examination her condition was very satisfactory.

Eye Examination.—Vision, right, was $+1.50$ S = 20/20, left $+2.00$ S = 20/30. The pupils were active and

for study, who gave the history, had the first attack of pellagra in 1914, and the main symptoms were a dermatitis on the hands, a stomatitis, and constipation. At that time there were di-

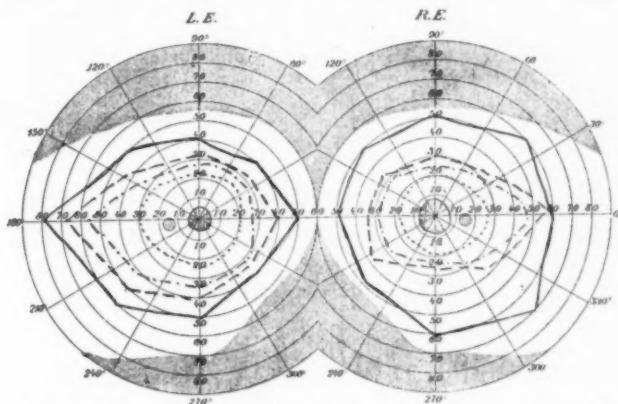


Fig. 4 (Case 4, July 25, 1916).—First examination: A fair equality between form and color fields; relative scotomas for green and red.

normal. The fundus was normal. The fields were within the normal limits for form, but the colors were somewhat reduced. In each eye there was a relative central scotoma for green and red. The nose and the sinuses were normal.

April 12, 1917, the patient claimed that she was well of pellagra. The

gestive symptoms, such as hyperacidity. In 1915 there was a recurrence of the same symptoms, but in 1916 there were no manifestations, and the general health of the patient had improved. In the summer of 1915, sight became very bad, and she could not recognize acquaintances across the street. It gradually improved. She was not ad-

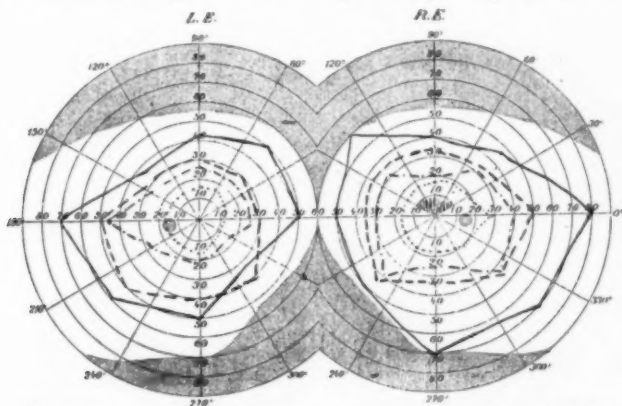


Fig. 5 (Case 4, April 12, 1917).—One year later: Fields for form somewhat irregular, with an interlacing of colors; a relative paracentral scotoma for colors in the right eye.

fields, however, showed more irregularities, and there was a relative paracentral scotoma in the right eye.

CASE 5.—History.—Mrs. M. O'D., white, aged 35, referred by Dr. Mizell

dicted to the use of drugs, alcohol or tobacco. A general physical and laboratory examination was negative. The nose and sinuses were negative.

Eye Examination.—Vision, right and

left, was 20/100 unimproved. The pupils were round and the reflexes normal. The fundus was negative except for a decided pallor of the discs in the temporal half.

chronic toxic retrobulbar neuritis. The diagnosis of chronic retrobulbar neuritis caused from pellagra may, therefore, be properly questioned.

CASE 6.—*History*.—M. C. G., white

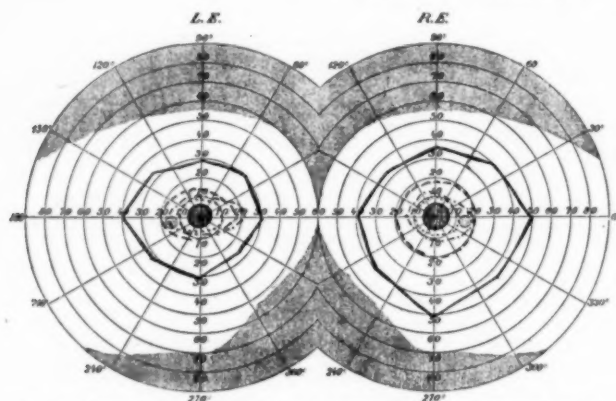


Fig. 6 (Case 5, Aug. 28, 1916).—A fairly regular contraction for form and color, with relative central scotomas for red and green.

The fields were contracted for form and color, and there was a relative central scotoma for red and green.

Nov. 16, 1917, the general symptoms were much improved, but the patient was very despondent. The right disc showed increased pallor in the papillomacular bundle, and the visual fields were more contracted.

male, aged 54, was confined at the Piedmont Sanitarium in the service of Dr. J. E. Paullin, who requested that I examine his field and eye grounds. He complained principally of abdominal pains, bleeding hemorrhoids, general weakness and defective sight of three or four weeks' duration. The history showed that the patient had had chills

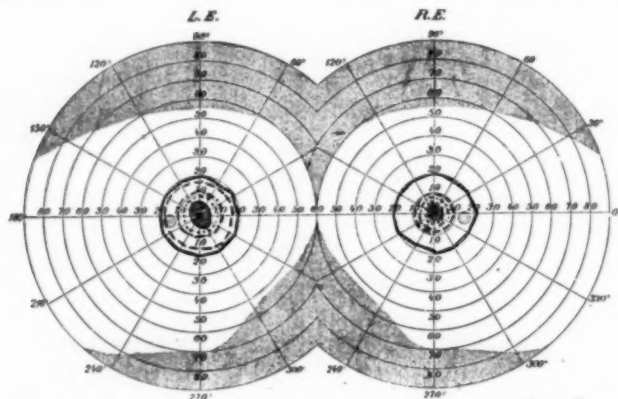


Fig. 7 (Case 5, Nov. 16, 1917).—One year later; the fields show greater contraction; the scotomas remain.

While the following two patients (6 and 7) unquestionably had pellagra and probably died from the disease, there were present additional factors, namely, tobacco, alcohol and morphin, either of which might have produced a

and fever as a child, hemorrhagic fever in 1882, dengue fever in 1884, yellow fever in 1888, and typhoid in 1911. He denied having had syphilis. He smoked five or six cigars daily, but for several weeks prior to admission to the

sanatorium he had not used tobacco. He drank 4 or 5 ounces of whiskey daily, but had never been intoxicated. The principal points in the examination were an intense pyorrhea, raw

addicted to morphin, and while in the sanatorium the drug was found on his person.

Eye Examination.—The eyes were examined in bed on admission to the san-

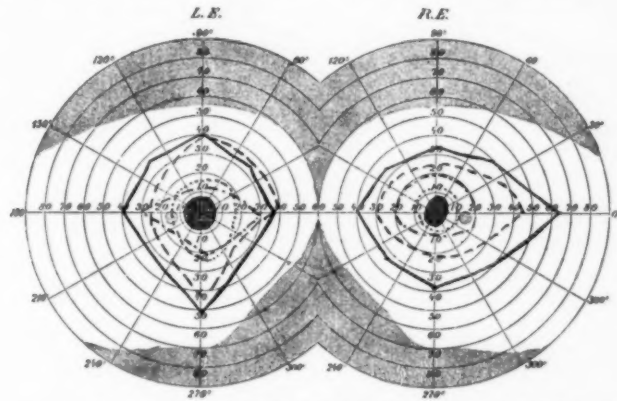


Fig. 8 (Case 6, Feb. 14, 1914).—Contraction for form and color with marked irregularity in the left eye; absolute central scotomas for colors.

tongue, red and raw buccal mucosa, and bleeding hemorrhoids. These were resected by Dr. F. W. McRae, and fifteen days later there developed a typical pellagrous erythema on the dorsal surface of both hands and about the neck. Mental symptoms then also developed, as well as a diarrhea, and the patient's

atorium in Atlanta, when he was rational. The vision could not be accurately estimated, but he could count fingers at 6 and 8 feet. The pupils were active and of normal size. The fundus showed a mild retinal arteriosclerosis. The fields were contracted for form and color with central sco-

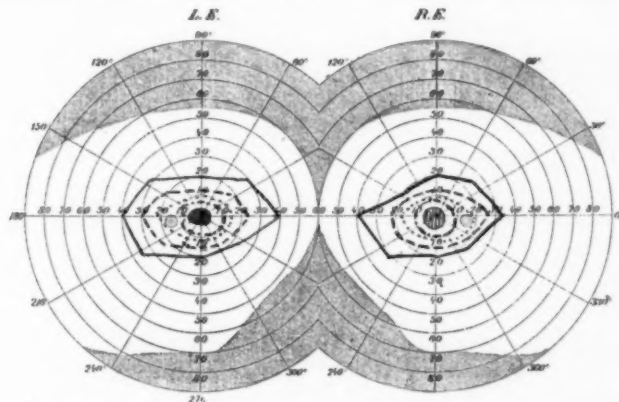


Fig. 9 (Case 7, Dec. 3, 1915).—A fairly well defined horizontal contraction for form and colors; in the right eye there is a central relative scotoma for red and green, and in the left an absolute scotoma for all colors.

condition became so desperate that he was transferred to the Georgia State Sanitarium for the insane at Milledgeville, where he died, Nov. 25, 1914. After death I learned that he had been

toma. My attention at that time was not directed to the association of eye changes (fields) with pellagra, and alcohol and tobacco were considered the cause for the chronic retrobulbar neu-

ritis. Later developments and further study of the case now lead me to believe that pellagra was probably the cause for the defective sight, as the complete withdrawal of alcohol and tobacco for about two weeks did not materially improve his vision, and his physician and nurses did not believe that any quantity of morphin had been used daily.

CASE 7.—History.—J. W. S., white male, aged 50, street car conductor, referred for study by Dr. George Mizel, first developed pellagra in 1913 and presented all the typical symptoms, such as red tongue, sore mouth and

scotoma for all colors. The contraction for red was most marked. Nose examination was negative.

He was urged to leave off the use of tobacco, which I am confident he did, and in one month sight had slowly improved in the left eye to 20/100. He died two months later of pellagra. After his death I was told that he had been taking daily for about two years 2 grains of morphin. As the patient did not use alcohol in conjunction with tobacco, which was withdrawn for over a month with no material improvement in vision, and as 2 grains of morphin a day is not considered a large

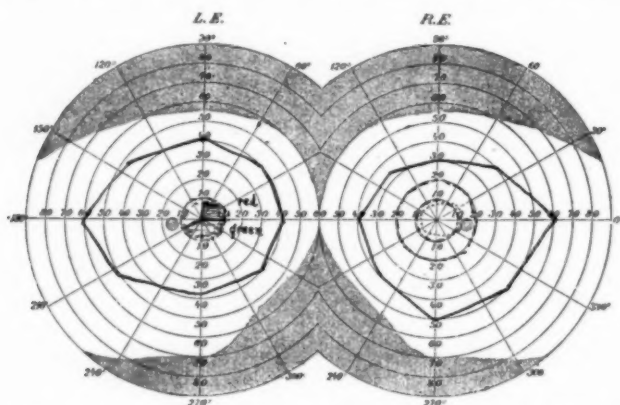


Fig. 10 (Case 8, Jan. 1, 1916).—A regular contraction for form and colors; in the left eye there is a peculiar sector-shaped relative scotoma for red and green.

rectum, digestive disturbances, and the characteristic dermatitis on the dorsal surface of both hands. Under appropriate treatment the symptoms subsided and his condition greatly improved. The patient was a pipe smoker, but had taken only one drink of whiskey in three years.

He complained of defective sight for nearly three years, and within the eight months prior to his visit, it had rapidly grown worse.

Eye Examination.—Vision, right, was 20/100; left, 15/200 unimproved. The fundus showed in the right eye some tortuosity of the retinal arteries, while the left was normal. The field of vision in each eye was contracted for form and color. In the right eye there was a central relative scotoma for red and green, and in the left an absolute

dose for an addict, we can reasonably assume that there were other factors that caused the scotoma.

In this series there were three other cases in which, besides a marked contraction in the field for form and color, there were either pericentral or paracentral scotomas.

CASE 8.—History.—Mrs. E. J., white, aged 31, an inmate of the Georgia State Sanitarium for the insane at Milledgeville, in whose case the history, examination and notes, as in all others at this institution, were most complete and thoro, had several acute attacks of pellagra before commitment in 1914, when the diagnosis of maniac-depressive insanity was made. This is one of those interesting cases in which pellagra was associated with some

psychosis. I am not sure that authorities are agreed as to their relation.

Eye Examination.—Vision, right and left, was 20/20. The fundus showed decided pallor of both discs, especially

the time of the examination, Jan. 1, 1916, the patient was in excellent health, of good mentality, and cooperated well in the examination.

Eye Examination.—Vision was: right,

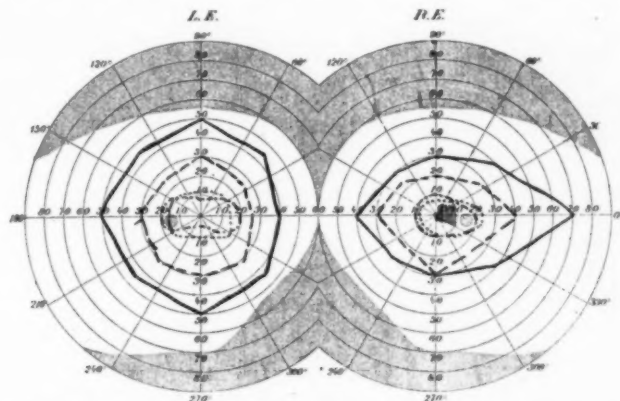


Fig. 11 (Case 9, Jan. 1, 1916).—A horizontal and vertical contraction with some interlacing of the reds and greens; there is a paracentral relative scotoma for red in the right eye.

in the papillomacular bundle. The patient was very dull and slow to answer questions, making the perimetry examination difficult. The right field showed a contraction for form and color. The left eye presented a peculiar form of sector-shaped relative scotoma for red and green.

20/30; left, 20/20. The pupils were active, and the fundus was normal. The fields were contracted for form and color. There was paracentral relative scotoma for red in the right eye.

CASE 10.—History.—Mrs. C. C. M., white, aged 37, residing in a suburb of Atlanta, had been an active pellagrin

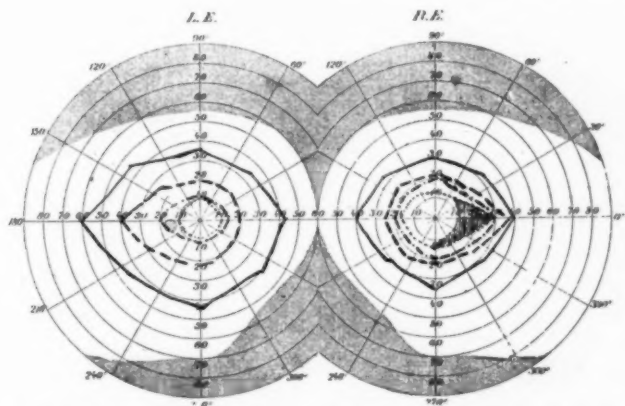


Fig. 12 (Case 10, May 1, 1916).—Moderate contraction for form and color, with a relative paracentral scotoma for green.

CASE 9.—History.—Mrs. M. H., white, aged 29, an inmate of the Georgia State Sanitarium, had been admitted in 1913 on account of insanity due to pellagra. The history was of no consequence. At

in 1907, with symptoms for two and one-half years. She had been seen by Dr. Mizel in 1911, when the symptoms were still apparent. Her mentality was good. Improvement had been gradual,

and at the time of the examination she was in a fair state of health.

Eye Examination.—Vision was: right, 20/20; left, 20/30. The left fundus showed yellowish deposits in the sub-retina between the macula and the disc.

tories or eye examinations, as they are unimportant. It is to be observed that there is a marked contraction for form and color, and often an interlacing or transposition of the colors, especially the red and green.

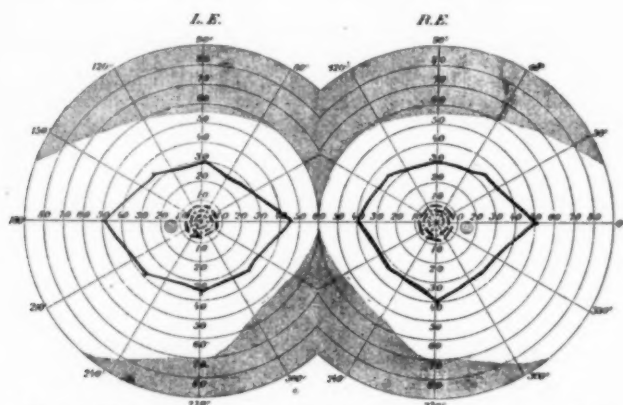


Fig. 13 (Mrs. N. C., Jan. 1, 1916).—A case in which there are irregularities for form and colors without central changes.

The fields showed moderate contraction for form and color. There was no scotoma. Four months later there was present in the right eye a relative pericentral scotoma for green, which included the blind spot. Both blind spots were slightly enlarged temporally measuring 7 by 7 mm.

At a subsequent examination of the patient Mrs. J. E. B., Nov. 9, 1917, she stated that she had recovered from pellagra, but that she was nervous and suffered from insomnia. There were no manifest lesions of pellagra that I could detect from a casual examination. The fields remained about the

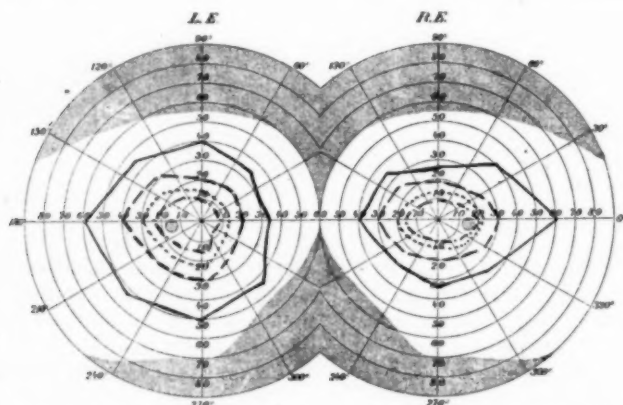


Fig. 14 (Mrs. M. W., April 26, 1915).—Irregularities for form and colors without central changes.

There was still another class of pellagrins who showed variations in the visual field without scotomas. I present herewith the fields of several of those, without the records of their his-

same, except for a marked interlacing of colors. No scotoma was present.

COMMENT.

In regard to the pathology of the

foregoing field alterations, thus far I have not been able to demonstrate any definite nerve change. I have had examined by competent pathologists, with negative results, the nerves and chiasm from three negro patients, and the retina of another negro patient, who died of pellagra at the Georgia State Sanitarium. However, no field or ocular examination had been previously made.

Dunlap,¹⁵ in an examination of the brain of pellagrins found axonal degeneration of the cortical nerve cells, which change had been similarly noted by Spiller¹⁶ in chronic alcoholism. Dunlap

monly occurs in the disease. Field changes similar to some of those here described (retrobulbar neuritis with central scotoma) occur in diabetes, in which an acidosis is frequent, and Francis has recorded cases of central blindness in which, after a most careful examination, only acetone in the urine was detected, and sight improved along with the disappearance of the acetone from the urine. So far my investigations along these lines, with the help of my colleagues, have been negative.

De Schweinitz,¹⁸ in discussing Francis' paper, did not regard an acetoneuria as a cause for central blind-

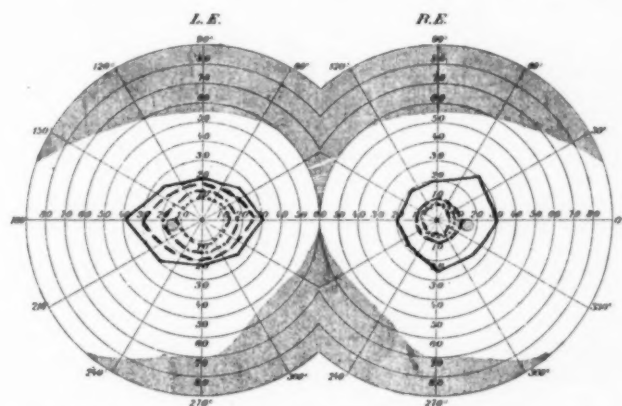


Fig. 15 (Mrs. J. E. B., May 20, 1916).—A good illustration of a case in which there are irregularities for form and colors without central changes.

further states that "in the absence of a clinical history, we have no means of saying on pathologic evidence alone, whether a given case is one of pellagra, or a central neuritis, or an alcoholic psychosis." Clinically these observations have been confirmed by Lorenz,¹⁷ who compares the mental state of pellagrins with the toxic psychoses, of which alcoholism is a good example.

This evidence furnishes a clue, the study of which might bring more positive findings. It is reasonable to believe that the cause of the nerve changes that produce alterations in the visual fields and central areas is the toxic state which clinicians admit occurs in pellagra. It has been asserted by Harris, one of the foremost workers in pellagra, that an acidosis com-

ness, although it might be regarded as an accompanying symptom. Indeed, he says there is experimental proof that acetone has no selective action on the papillomacular bundle of the optic nerve. He further states that these scotomatous areas may represent a central retinal exhaustion, or perhaps a corticosensory fatigue, besides the usual lesion in the axis of the optic nerve fibers; and it is often difficult to arrive at a correct diagnosis.

Lohmann¹⁹ mentioned that peripheral contractions, especially the "elastic" types, often occur in dementia precox, dementia paralytica, dementia senilis, and in conditions of severe depression, and are probably due to exhaustion.

From a study of these visual fields

two definite groupings can be made; first, those caused by organic changes in the visual path and, second, those changes that are purely functional in character.

Of the first group we at once recognize changes that resemble those commonly seen in a chronic retrobulbar neuritis caused by tobacco, alcohol or other toxic substances. And it is very possible, as suggested by Gradle,²⁰ that the vessel-bearing portion of the nerve is the part first affected, and the subsequent degeneration advances centripetally and centrifugally, involving the vertical oval fibers of the papillomacular bundle that are placed immediately anteriorly to the entrance of the central vessels, and later the V-shaped sector that occupies the temporal quadrant of the advancing nerve.

Again we must not lose sight of the fact that this degeneration or alteration may be in the central nervous system involving the visual centers. Of the second grouping the most striking change in many of the cases is the interlacing of the colors and the equality of the form and color fields—often of tubular character. This interlacing of the colors is highly suggestive of hysteria; in fact, Peter²¹ maintains that other than by inaccurate measurements, only hysteria can cause this change. These ideas, coupled with the word of de Schweinitz mentioned previously regarding the scotomatous changes due to exhaustive processes, would strongly suggest that the alteration was a functional disturbance. And in a disease so chronic and so depressing as pellagra, in which every body tissue suffers from the profound toxemia, this complication is to be expected.

If the optic disk in all cases of pellagra appeared normal, one could read-

ily accept the view that these scotomas and contractions in the fields were of an exhaustive nature or one of fatigue; or, even more properly, a functional disturbance of the optic nerve. But, as often a decided pallor of the papillomacular bundle of the disc and frequently an optic atrophy can be clearly demonstrated in these cases, I am inclined to consider the change as an ascending or descending neuritis, with definite degenerative nerve changes as would occur in chronic retrobulbar neuritis caused by various drugs and alcohol. However, positive evidence is lacking by the inability to secure such specimens, when the diagnosis could be confirmed both clinically and microscopically. It is my impression of the disease that when the chemistry of this toxemia is satisfactorily explained, not only shall we have interpreted the cause of the chronic retrobulbar neuritis, but a great step will be made in determining the etiology and the specific treatment of pellagra.

CONCLUSION

I believe that we can definitely claim that (1) reduced vision is a symptom in pellagra, (2) that definite atrophic changes can be detected in the nerve head in a small proportion of the cases, and (3) alterations in the visual field with central and paracentral scotomas are common.

I wish to take this opportunity to express my appreciation of the hearty cooperation given me by Drs. J. Clarence Johnson, George C. Mizel, Stewart S. Roberts, H. F. Harris and J. Edgar Paullin of Atlanta, and especially Dr. B. McH. Cline of the staff of the Georgia State Sanitarium for the insane at Milledgeville. Without their aid this report would not have been possible.

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NOTES, CASES, INSTRUMENTS

A PRACTICAL POINT IN THE TECHNIC OF CORNEAL TATTOOING.

SAMUEL THEOBALD, M. D.

BALTIMORE.

Read before the American Ophthalmological Society, July 10, 1918.

A case of rather extensive, and very irregularly outlined corneal opacity, the result of a penetrating wound of the cornea, with laceration of the iris, in early childhood, which recently came into my hands for tattooing afforded some ground for cogitation when the point was reached of deciding how I should proceed in the matter. A minimum of traumatism, because of the grave nature of the injury which the eye had suffered, and the insertion of the India-ink just where it was needed, and only there, were the desiderata.

At the first sitting, following my usual practice, I applied the ink to the cornea and pricked it in with a Weiss cataract needle. It was, almost at once, manifest, however, that this procedure was ill adapted to meet the conditions, for the ink completely obscured the field of operation, and it was quite

impossible to distinguish between the clear cornea and the irregularly outlined corneal capacity; furthermore, I could feel no assurance that I might not be stabbing, more than once, the same spot in the leucomatous tissue.

A trivial amount of irritation followed the operation, and in two days the condition of the eye warranted a repetition of the tattooing. This time, however, I reversed the order of procedure—first using the needle and afterwards rubbing in the ink. With an unobscured field, I could see distinctly the outlines of the corneal opacity, and tell exactly where the little oblique stabs should be made; and, besides, it was easy to avoid making more than one stab at the same spot. The ink was applied with a small cotton mop and gently rubbed in with a Daviel's curette. The cosmetic effect as observed the next day was most satisfactory, and only one more sitting, after the lapse of another twenty-four hours—the same procedure being then followed—was required to complete what I may, perhaps, be pardoned for calling the requisite "camouflage."

A cursory examination of the literature bearing upon the subject in my library showed that the procedure

which I had employed with so much satisfaction was not novel; but, on the other hand, it convinced me that its advantages were little known, for I found that a large majority of the authorities, in describing the operation of corneal tattooing, spoke only of the application of the ink to the cornea before the use of the needle or of pricking the ink into the cornea by means of a grooved needle. And it is for this reason that I have thought it worth while to make this communication.

Cocain in four per cent. solution, supplemented by a single application of a 1 to 1000 adrenalin solution, afforded very satisfactory anesthesia. Murdoch's speculum was used to keep the

PECULIAR ANOMALY OF THE FUNDUS OCULI.

COL. S. HANFORD MCKEE, C.M.G.,
C.A.M.C.

MONTREAL, CANADA.

Col. McKee, Officer Commanding at the West Cliff Canadian Eye and Ear Hospital near Folkestone, Kent, England, places on record this interesting anomaly revealed by the ophthalmoscope.

During the routine examination of a large number of men on service, many peculiar conditions of the fundus oculi have been seen. The following case was thought odd enough to warrant publication.

Private E. A. Y., aged 24 years, was sent to West Cliff Hospital for exami-

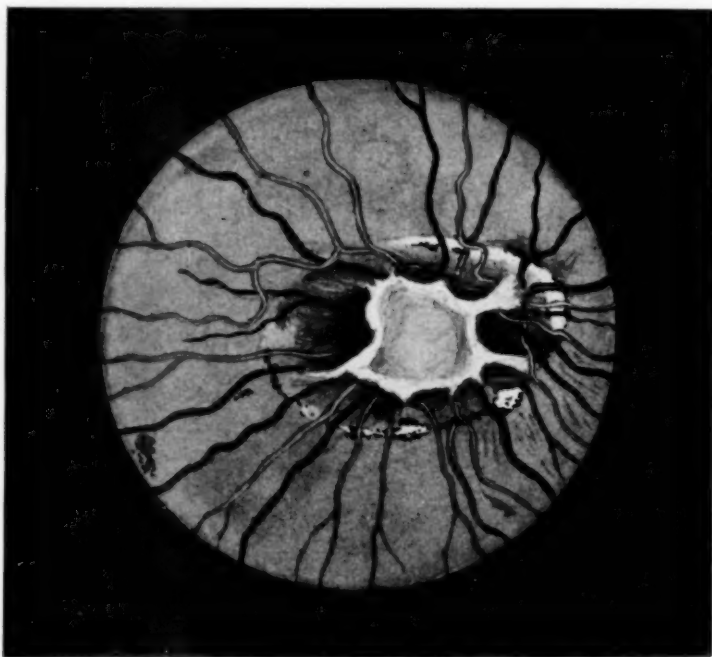


Fig. 1. Anomaly of fundus oculi (McKee).

lids apart, but fixation forceps were not employed, the eye being steadied by the finger-tip. The India-ink, which there is good warrant for believing contains no microorganisms, was not sterilized, but was rubbed up with a few drops of sterile water upon a suitable sterilized glass dish.

nation of the eyes. Vision of the right eye was perception of light, that of the left 6/6; nothing abnormal about the right eye externally. On examining the right fundus the picture seen was as follows: At the area of the optic disc one sees, instead of the disc, a rectangular pearly white membrane, attached

by bands to the retina at each corner except at the superior temporal. This membrane hangs in front of the retina like a curtain. It is a good deal larger than the normal optic disc and at the superior temporal corner slightly more than one millimeter from the underlying retina. On the superior border the artery runs along to the temporal part with numerous branches extending to the area above. To the nasal side and below the vessels are also profuse. About this membrane there are seen pigmentary changes denoting almost a complete rupture of the choroid. There are also one or two areas of displaced pigment in other parts of the retina. (See figure 1.)

This man gives a history of blind right eye from infancy. No history of injury. As a child he had been taken to numerous infirmaries, where examination of his right eye had always excited considerable interest. This case was sent to a large Ophthalmic Hospital for observation. The following are some of the opinions given on the condition:

1. A congenital coloboma of the sheath of the optic nerve.
2. A congenital defect.
3. A condition following injury at birth.
4. An inflammatory change in early fetal life and consequent formation of scar tissue in or on the disc.

CONGENITAL DEFECT OF TARSUS WITH HYPOPLASIA OF MEIBOMIAN GLANDS.

KAZUO HIWATARI.

KAGOSHIMA, JAPAN.

The following case might be an extremely rare malformation of the eye, no one yet having described it, so far as my literature study can reach.

The patient here recorded, a virgin aged 18, attended our ophthalmologic clinic (the medical college hospital, Osaka) on account of discharge from her right eye, on March 10th, 1913.

On the left eye she had a leucoma

adherens subsequent to an ulcer of cornea from which she suffered in the sixteenth year of her age; otherwise she was quite healthy since her birth.

There were no malformations to be ascertained in her family history on exact inquiry.

The eyelids seemed quite normal externally and their motility was also excellent.

In respect to the borders of the lids nothing pathologic was to be found.

Now when I tried to evert the upper lids I felt unexpectedly an abnormal softness of them, owing surely to the absence of supporting tissue in them, as in everting the tarsectomized eyelids or the eyelids of a rabbit.

And therefore the upper lids must be kept everted during the observation of conjunctiva by the finger pressed under the skin of the lid. The lower lids were also very soft owing to the same reason.

Tarsectomy was absolutely denied, so that it must be concluded to be a congenital defect of the tarsus.

I made some further observations about the eyelids which I shall describe shortly.

THE MEIBOMIAN GLANDS

They were greatly reduced in their number and irregular in their form.

Some of them were namely narrower and longer, some of them wider and shorter than the normal, and again others were globular.

Beside them there were several small yellowish corpuscles under the conjunctiva which might be considered as the rudimentary formations of the Meibomian glands.

The Meibomian glands, including the rudimentary ones, were to be counted 20, 13, 8 and 10 upon the right upper, left upper, right lower and left lower eyelid respectively through the smooth conjunctiva.

The orifices were rudimentary and were to be pointed out upon the upper lids 8 and 13 in number on the left and right side, respectively, particularly only by means of loupe, while they

were by no means to be found upon the lower lids.

THE EYELASHES

They were generally arranged irregularly, particularly upon the lower lids, being counted in number:

- 108 Upon the right upper (longest one, 1 cm).
 - 122 Upon the left upper (containing many minute ones, longest one, 1 cm).
 - 55 Upon the left lower (longest one, 6 mm).
 - 62 Upon the right upper (longest one, 6 mm).
- A further abnormality of the eye-

lashes was the presence of hair follicles, one upon each right and left lower lid, from which two and three cilia jutted respectively instead of one, and such an abnormality of the eyelashes was exactly described by Contino (v. Graefe's Archiv für Ophthalmol. v. 81, p. 122).

The lacrimal puncta were found in normal position.

I believe that the above described case can be considered consequently as a congenital defect of the tarsus combined with hypoplasia of the Meibomian glands and their ducts, altho a microscopic examination was not performed and such an abnormality might be easily explained probably by atavism.

SOCIETY PROCEEDINGS

AMERICAN OPHTHALMOLOGICAL SOCIETY.—FIFTY-FOURTH ANNUAL MEETING.

NEW LONDON, CONN.

July 9 and 10, 1918.

President, DR. WILLIAM H. WILDER,
CHICAGO.

(Continued from page 795)

Ocular Conditions Affecting the Efficiency of the Aviator.

COL. WILLIAM H. WILMER, Washington, D. C., stated that, in addition to the stress of conflict common to all branches of the military service, the aviator is compelled to subject himself to changes of environment so sudden that there is but little opportunity for adaptive adjustments to occur. One of these changes is from normal sea-level oxygen tension to a tension much decreased.

Under conditions of lowered oxygen tension, certain well known physiologic alterations, adaptive in nature, take place. At the Medical Research Laboratory, conditions of lowered oxygen tension are produced artificially by means of a large low-pressure chamber and with the Henderson rebreathing apparatus. The tests made with these different forms of apparatus correlate so closely as to convince one that the physiologic changes noted are due to want of oxygen; and not to the lessened atmospheric pressure.

It is difficult to say how much of the disturbance in function is due to sub-oxydation in the central nervous system, and how much is due to changes in the muscles themselves. The increased need is met in good subjects by increased depth of respiration, dilation of the peripheral vessels and more rapid heart beats. More frequent respiration and increased blood pressure are clumsy attempts at adaptation, and the airman soon breaks under such tension.

While the eye is only one of the sense organs concerned in the function of the

equilibrium it is second to none in importance. We have found that its proper functioning is affected by oxygen want, apart from the other conditions of flight. In various accident reports from aviation sources, there is constant reference to the statements by pilots that vision was blurred during flight. We have, therefore, made tests to see what changes do occur in the eye under lowered oxygen pressure.

On the whole, we have not found any very marked change in the acuteness of visual perception. The great variations have been due to the falling off in the power of muscular adjustments. We have found very little practical change in color vision. The tests of the visible field indicate that the periphery of the retina is much more sensitive to oxygen want than is the macular region. Above 15,000 feet there is contraction of the fields for form and color. The tests at the laboratory also show that the field for the accurate perception of motion direction is usually about three degrees less in all quadrants than the field for form as usually taken. Stereoscopic vision does not suffer any serious impairment as the result of oxygen deprivation. The test for the simple visual reaction time has not seemed to us to be of much practical value, but the Reeves visual discriminating reaction time test is of great ophthalmo-psychologic value.

The serious ocular disturbances produced in the peculiar environment of the airmen take place in the extrinsic and intrinsic muscular apparatus. There is, in many cases, a falling off in accommodation, convergence; and, naturally, in the fields of binocular fixation. With the failure of accommodation, it is impossible to read the figures upon the ever increasing number of instruments in the fuselage. The pilot has to shift his gaze quickly from the great expanse around him to the cockpit. Therefore, the accommodation must be not only accurate, but free from abnormal lag. So, too, the failure in convergence means double and confused vision.

As a result of these tests we are more and more impressed with the vast importance of the initial selection of candidates who possess good eyes and well balanced muscles, who have good adduction and who are practically free from hyperphoria. Equally important is the proper classification of the candidate, that he may be assigned to the work for which the laboratory tests have shown that he is best fitted. By the constant, watchful care of the flight surgeon and of the physical director, many cases of incipient staleness among the flyers can be detected; much economic waste can be avoided for the Government, and valuable young lives can be saved.

DISCUSSION.

Dr. Alexander Duane, New York City: Col. Wilmer spoke of the necessity of color vision in aviators. I should like to ask whether it is the color vision *per se* that is required, the ability to distinguish colors, or rather the light sense that is in question.

I was asked to examine a man who was coming up for the aviation section, and he was very definitely color blind. But being such a good man, they asked me to have another look at him and see whether he could be passed. I had to report that he was decidedly color blind in every test; but that, nevertheless, I thought that he could be tried practically, to see whether he would possibly do.

I did so for two reasons. First, that he had already had a year's flying, and a very successful one; and, second, that he was able to make extremely fine distinctions of light and shade, and apparently of color. Of course, he could not tell the colors as we do; but he could make distinctions at considerable distances. He told me that he never had the slightest difficulty, in cutting down, in recognizing a patch of green field, a patch of flower field, etc. It occurred to me, that our test in that sense might not be so useful. We might reject a man who might be valuable.

Col. Wilmer, Washington, D. C.—Certain classes of cases that are color blind do work in. For instance, we found a man could slip thru who was

totally color blind. We kept him as an instructor; but to a maker of maps or a combat pilot, color vision is essential. He must recognize the lights of his own airdrome and hangar, and be able to find his way home by noting the differences between the chimney pots and roofs. Color vision is essential.

Of course, we all recognize that there is no relation between color blindness and luminosity sense. The latter is sometimes very good in people with no conception of color values. There are certain types of air men who could be used very well, if color blind. But others, those who locate the enemy's artillery, etc., must have color vision. The enemy is clever in flying early in the morning, thus forcing our men to fly with the sun in their eyes. They must wear colored glasses. With weak color vision, they are unable to distinguish between the enemy uniform and their own.

New Instruments and Apparatus.

DR. WALTER L. PYLE, Philadelphia, Pa., exhibited and pointed out the advantages of a new *trial frame* for test lenses.

DR. CARL KOLLER, New York City, described his improved system of illumination for the *electric ophthalmoscope*. This substitutes, for the reflecting hypotenuse surface of a rectangular prism, a twice reflecting prism with a sharp edge upward; allowing the nearest approach to the pupil and so giving the largest field of vision. This system of illumination had been devised by Dr. Koller; and applied by the instrument maker to another ophthalmoscope without his knowledge or consent.

The Ergograph.

DR. LUCIEN HOWE, Buffalo, N. Y., discussed the present form and use of this instrument for measuring fatigue of accommodation and convergence. It is useless to explain the description of a complicated piece of apparatus without its being here. All I purpose to do, is to call attention to the test object for measuring the fatigue of accommodation. Last year, one of our exceedingly well qualified members made objections to it and suggestions concerning it, stating that what we called

fatigue of accommodation was not of the ciliary muscle but of the retina. I talked the matter over with Dr. Ferree of Bryn Mawr, who studied that aspect of it. He was of the opinion that it made very little difference whether we used a letter or an object. However, instead of using letters, what we used for exact test objects for the near point, and also for distance, is a series of characters, dots or squares, each one of which measures the angle of minimum visibility; and adjacent to it a space which also measures the same distance.

The present form of the accommodation ergograph includes the test object, the measure of the distance of the test object from the eye and the recording apparatus. The present form of the convergence ergograph includes an arrangement of the rotary prisms, and the recording apparatus. Dr. Howe discussed how to use the ergograph and the records of fatigue of accommodation and convergence.

Inertia of Adjustment for Different Distances.

DR. C. E. FERREE read for himself and Dr. Gertrude Rand the paper published in full on p. 164.

DISCUSSION.—Drs. Lucien Howe and Dr. William H. Wilder briefly expressed their appreciation of it. Dr. Walter B. Lancaster wished to bear testimony to the value of a visit to Prof. Ferree's laboratory, where some work was being done on accommodation.

Dr. Alexander Duane, New York City.—I, too, want to thank Dr. Ferree for his very suggestive paper, and to add one or two impressions that I gathered. He spoke of its practical application to aviators, its application to other branches of the service is equally obvious, and to none more so than the navy. The conditions there for seeing under different circumstances and surroundings, are such as call for just the kind of adjustments that he has spoken of.

For example, take an officer on the bridge of a battle ship in action: He has to make the quickest kind of ad-

justments of vision for far and near seeing of objects. There are all kinds of difficult conditions under which he has to make these instantaneous adjustments that Dr. Ferree speaks of. There the men who might seem to be normal by our ordinary visual tests may fail, because they cannot make the rapid or instantaneous adjustments referred to. A difficulty in recognizing signals and answering them immediately might spell disaster. A moment's delay in recognizing the turning of the ships with the comparatively small distance between them, and in responding to that movement, would also spell disaster.

Dr. Ferree said also that the question whether the speed of adjustment could be trained or not had not been determined. I believe that it can, like all other faculties that we seek to train. I believe that the ability to make these instantaneous discriminations can be trained by practice; and I think that is a very fruitful field for investigation, not only to determine whether people have these abilities or not, but, granting that they have them to a moderate degree, to enhance their ability by systematic training. That is a point that could be investigated and carried out to the great advantage of the service.

Dr. Ferree: I believe with Dr. Duane that this faculty can be trained; but I do not want to go on record as saying that it can be done. I have not the results to back that statement up. The three observers with the high power microscope averaged among the fastest, tho they had some slight difficulty.

The thing that interested me particularly was the diurnal variation; and I am interested in working out the variations of age, especially if we are going to have men of the age of Major Mitchell enter aviation. There is not only this particular coordination of the eye muscles to be considered, but the coordination of the general muscular system, which could be worked out in connection with this. That is, we could have the observer indicate with the feet whether the letters pointed right, up, down, or left, at the same

time that the time was recorded on the drum. This would involve all that an aviator would need.

It is commonly reported that aviators grow stale. We would have a record on his condition day by day, to see whether he was up to standard, or anywhere near it. Not only the motor coordination in the eye, which perhaps agrees with other coordinations would be known; but you could coordinate these with other tests, and have them reported simultaneously on the drum with the time of visual discrimination. You would then have not only accuracy, which most tests involve, but speed as well.

Restoration of the Orbital Socket.

Dr. P. N. K. Schwenk and Dr. William Campbell Posey, Philadelphia, Pa., stated there are two groups of cases to be considered. In Group A, there was complete occlusion of the socket, and restoration was made by the employment of pedicled flaps taken from adjacent parts. (See p. 55.) In three cases reported union was firm, and there was no trace of a fistulous tract produced by the passing of the skin flap under the bridge formed by the union of the two pillars of the canthus; nor were they bothered by an outgrowth of hairs from the flap. The desquamation of skin from the flaps gradually subsided, and the sockets became dry, and more and more commodious. The conformer should be retained a long time, and interfered with as little as possible.

The first case was one of entire obliteration of the socket, due to a lime burn. The operation was performed, using a long-pedicled flap obtained from the forehead. The patient was permitted to go home with the conformer in position. But, thru lack of attention, it was allowed to slip; and the tissues contracted so that the conformer was no longer retained. A second operation had to be done to remedy this, with the result that an artificial eye can now be worn with comfort; and the cosmetic result, apart from immobility of the eye, is perfect.

The second case was also one of ob-

literation of the socket, due to a lime burn. A similar operation was performed, the canthus being restored by the method employed in the former case after a conformer had been inserted into the amply spacious socket. On the fifth day, however, the stitches holding the pillars of the canthus in apposition gave way, necessitating some time later a refreshing of the edges of the flap, and a lengthening of the pillars. Union was then permanent, and a suitable sized eye is now worn with comfort.

In the third case, the eye was lost by a lacerated wound, demanding enucleation. In consequence of faulty technic in this operation, the upper lid was firmly bound down to the underlying tissues by dense cicatricial bands. The lower cul de sac was also somewhat contracted. The operation was performed by the author's method. Recovery was uneventful. A proper sized eye is now retained without difficulty.

In the opinion of the authors, the Maxwell operation is admirably adapted for the restoration of the lower cul de sac. The objection to it is the tendency that the lid evinces to ectropionize at its outer half, after healing has occurred. This may be partially overcome by making the flap narrower. Another ingenious method has been proposed by Golovine for securing an artificial eye after exenteration of the orbit.

Group B consists of cases with incomplete occlusion, some of the conjunctiva being still present. Wiener's method is especially applicable to this class of cases. Without having any knowledge of Wiener's contribution, one of the authors (Schwenk), in 1915, while attempting to restore a shrunken socket in which some mucous membrane was still present, used a procedure differing from Wiener's operation only in the location of the cul de sac anterior to the cartilage of the lid, instead of posterior to it. In the Wiener method, a large denuded area, from which the conjunctiva has been taken, is left exposed in the socket, and must be covered with

grafts; but in the authors' method, no raw surface at all remains. Dissection is done beneath skin and conjunctiva. This method was used in the following case:

A young man of twenty-eight, whose eye had been enucleated eleven years before on account of severe injury, had worn badly fitting glass eyes until cicatricial contraction had prevented their retention. The authors' operation was done; recovery was uneventful, and the result was all that could be expected, a proper sized artificial eye being worn with comfort.

The authors' method consists in undermining the orbital mucous membrane by a submucous incision, followed by a subcutaneous incision at the lid margin, thereby uniting the subcutaneous and submucous cavities. The dissected conjunctiva is transferred into the apex of the subcutaneous cavity, by the insertion of a series of double armed sutures.

DISCUSSION.—DR. TARUN—I want to endorse what Dr. Posey has said about the advantages of the Maxwell operation. The procedure is especially applicable to cases where the conjunctiva is somewhat contracted; and where the artificial eye has produced scar tissue in the lower cul de sac, with an eversion of the lower lid, or ectropion. The advantage is that if care is taken to attach the flap to the loose margin of the tarsal plate, the ectropion disappears and the lid comes into proper position. It is necessary to wear an artificial eye as soon as the operation is terminated, to keep the true margins adhering. At the same time, it produces a large sac in the lower part, and also produces inversion of the lid, which corrects the deformity. I have not had an opportunity to try it on the upper lid, but I am afraid that in the upper, the levator muscle has a great deal to do with the result obtained.

Dr. William Zentmayer, Philadelphia, Pa.—I have done the operation on the upper lid, and found that the levator offered no hindrance to perfect technic. I have done the operation six times, and the results have all been

very favorable. The mistake apt to be made is to make too broad a pedicle. All you need is a narrow sulcus. Eight millimeters is wide enough. It is the most ingenious plastic operation in eye surgery. I saw a case recently in which I had operated on both lids four years before. I found the floor of the orbit perfect. In the operation of Dr. Weeks, satisfactory as it often is, the shrinking gives an imperfect result with lapse of time. That was my experience in the one case in which I tried it.

Dr. Edward B. Heckel, Pittsburgh, Pa.: It is not only the difficulty with which these operations are done, or, rather, the difficulty in arriving at a successful conclusion. I have had the privilege of operating on several cases in the last ten years, and used a single piece of autogenous epithelial graft to restore the socket in partial or complete destruction. I have a drawing of a case on which I operated a year ago last March, the photograph of the individual wearing an artificial eye. There was only partial destruction of the socket. The upper part was destroyed by a burn.

The dissection was made to enlarge the socket, and one piece epithelial graft was taken from the inner surface of the arm. The conformer was made by taking a piece of wet cotton sufficient to entirely fill the socket. That was covered with a piece of rubber dam, tied in front with a piece of strong silk. The external canthus was slit. After the conformer was made, the one piece epithelial graft was laid over the conformer, with the epithelial side against the rubber tissue. The lids were pulled down, and a compress bandage was put on quite firmly.

The case is inspected; and if there is no odor or discomfort, the bandage is allowed to remain six or seven days. When the bandage is removed and the conformer taken out, the socket is as large as the conformer. The dressing is removed daily, and a small amount of bichlorid vaseline, 1:3000, is applied to the socket. I have had no graft that has not taken. The excess shrivels up and disappears.

I find that in taking a graft, it is almost impossible not to have some hair on it, and some sweat glands. I operated on a case in which the entire socket was destroyed. I took the skin from the inner surface of the arm, and found, after a while, that there was a growth of hair and odor from the socket, as a result of the sweat glands that were in the graft. The glands have degenerated, and disappeared, and so have the hair follicles; so the hair has disappeared. The transplantation of a few hairs and sweat glands does not appear to be objectionable.

Dr. R. A. Reeve, Toronto, Can.—Dr. Heckel is to be congratulated upon anticipating a line of treatment that is in vogue now in France and Great Britain. It was spoken of by Sir Arbuthnot Lane on his recent visit. He said that they restore the orbital cavity in very serious injuries by simply making an incision, more or less deep; and taking, as the doctor did, the epithelial graft and applying it as he has done. They use the hard material that dentists use for taking casts, select an appropriate size, apply the graft on it, and stitch over it; so that the whole thing is tight.

The explanation of the losses of transferred flaps, that we sometimes regret so much, is that you do not keep the whole surface in contact with the raw underlying surface. By stitching the whole flap in tightly, you get perfect contact. They do not require to use their sense of smell, but just leave it *in situ* from five to ten days; and they have a perfect cavity. In addition, if they wish to resort to any measure to apply the artificial eye, they simply make a second incision, and put in a piece of cartilage, stitching the new epithelial surface over the cartilage. That takes, and they put in the eye. The result is very gratifying indeed.

Dr. William H. Wilder, Chicago, Illinois.—It has been my privilege to do a good deal of this work at the Illinois Eye and Ear Infirmary. We have used, for holding our grafts firmly in the socket, plates of lead, tin, or the

gutta percha material that dentists use, which can be molded to hold the flap in place. This method originated with the late Dr. Hotz and has been adapted and modified in various ways. These cases of total symplepharon of the orbit, and other cases of it where the eyeball is present, are adaptable for such treatment.

I have found, in almost every case, that a Thiersch graft, or a modified Thiersch graft, was as valuable as a Wolfe graft. I call a modified Thiersch graft one in which you not only take the epithelial layer of the skin, but go down in to the dermis proper and get firmer tissues, without going into the subcutaneous tissue. The difficulty with the Wolfe graft is that we do not dissect off the subcutaneous tissue and get rid of the fatty elements. With the modified Thiersch graft, you get a graft of good firmness, if necessary.

In preparing the socket for the plate, by taking away the redundant superficial tissue and scar tissue, the socket is made deep enough, above and below, to hold a plate that you have fashioned out of lead or tin, and easily keep it firmly in place. This plate can be covered with paraffin with a high melting point, and thickened to any degree desired to fill the socket.

After cutting off the Thiersch graft from whatever site you select, if you put the epithelial surface of the graft next to the paraffin surface of the plate, it adheres to it, and you can introduce it into the socket you have made. In forty-eight hours you can remove the plate, inspect it, turn it, and put it back in place; and you could keep it there until you are ready to apply the artificial eye.

Dr. Schwenk: Werner devised an operation to use where there was less contractility present, which it would be well to mention. He dissects as much of the conjunctiva as remains in the orbit up to the margin of the lid. Then he deepens the posterior cul-de-sac. He puts a flap right down into the apex, and fastens it there, and covers the raw surface remaining with Thiersch grafts.

Orbital Growths Removed with Preservation of Vision.

DR. WILLIAM CAMPBELL POSEY, Philadelphia, Pa., reported cases in which the growth was removed through an incision along the external orbital rim, permitting a Kroenlein resection of the orbital wall if found necessary.

Case I.—The patient was a male, aged forty-eight years, whose right eye had begun to proptose six years before examination. There were no inflammatory signs, and no history of trauma. The Wassermann was negative. The eye was fourteen millimeters in advance of its fellow. There was no palpable mass, nor could the eye be pushed back by pressure.

By an incision at the outer orbital rim, there was removed a large encapsulated tumor, the size of a small hen's egg, situated posterior to the globe, and lying in close approximation with the optic nerve below, but without connection with it. Two months after the operation, the proptosis was reduced to four millimeters. There was some limitation of outward motion. Pathologic examination revealed a spindle-cell sarcoma.

Case II.—The patient was a male aged twenty-nine years, in whom there had been gradual protrusion of the right eye for five years. The man's health was good; there had been no trauma, and the Wassermann test was negative. The eye was ten millimeters in advance of its fellow. No mass was palpable, and there were no fundus changes.

An incision was made at the outer angle of the orbit; and a mass, the size of the eyeball, was found resting upon the optic nerve, posterior to the globe, and somewhat to the outer side. It had a firm capsule, with no attachments. At the end of two weeks there was still a slight exophthalmos with some ptosis. The pathologic examination proved the growth to be a fibroma.

Case III.—The patient was a female, aged twenty-seven years, whose right eye had been prominent since early childhood; but there had been no apparent increase in the protrusion for

the past ten years. Her health was good, and the result of a Wassermann test was negative. The eye was eight millimeters in advance of its fellow. A smooth, hard mass was palpated at the upper angle of the orbit. A cyst with a firm capsule and dermoid contents was removed without difficulty. At the end of a month the proptosis had almost entirely disappeared, but there was some ptosis and limitation of the external motion of the eye. The pathologic examination showed the mass to be a dermoid cyst.

Case IV.—The patient was a female, eighteen years of age. She had noticed gradual protrusion of the left eye for eight months. She had typhoid fever three years previously, and the left postcervical and submaxillary glands were permanently swollen. There were no inflammatory signs. Examination for tuberculosis and syphilis was negative. The blood count was also negative. The eye was down, and somewhat out, seven millimeters in advance of its fellow. There was a palpable mass under the upper, outer portion of the orbital rim.

No fundus changes could be seen. The glands at the posterior border of the left sternomastoid muscle were markedly hypertrophied, and the same condition prevailed in the glands of the left submaxillary region. A tumor, the size of a large almond, was successfully removed by incision over the mass. The globe returned to its normal position in the course of several weeks. The pathologic examination showed the tumor to be an adenoma.

In all of the four cases, X-ray examination of the orbit and surrounding sinuses was negative; nor did a nasal examination show any evidence of existing sinus disease. These cases show the advantage of prompt operative measures, and the futility of tentative medicinal and other forms of palliative treatment in most forms of orbital neoplasms.

The author's method follows the Kroenlein procedure until the resection of the bone is reached. This is done in such a manner that the whole orbital apophysis of the malar bone is dis-

placed, without splintering, in one block, so that it can be replaced at the end of the operation.

Two Orbital Tumors.

DR. A. EDWARD DAVIS, New York City, read the report of the two cases, published in full, p. 828.

Sarcoma of Orbit, Treated by X-rays.

DR. WILLIAM M. SWEET, Philadelphia, Pa., read the paper reporting a case, published in full on p. 830.

DISCUSSION:—DR. J. H. CLAIBORNE, New York City: The Kroenlein operation is popular. It gives an opportunity for a surgeon to exploit himself. But I am convinced that it is not necessary in the majority of cases to do it, unless, by chance, the tumor is disseminated throughout the orbit.

I had the case of a woman of forty-five years, whose left eye was proptosed and who had diplopia. I made an incision over the rectus and found a hard tumor, to which was attached the lacrimal gland. With my finger, I got behind the tumor, resembling a decidedly large olive, without any difficulty. I found it necessary to shave off a little of the external part of the orbit, and I could look in very well. The operation was done so easily on that occasion, I have never found occasion to do the Kroenlein operation, and should like to know whether others have been able to achieve these results without that larger operation.

DR. R. A. REEVE, Toronto, Can.: I should like to ask Dr. Davis why, after an interval of a week, he did a secondary operation. His was a case of endothelioma. A good many years ago, by a large incision, extending through the lower part of the brow, from the external to the internal margin of the orbit, I was able to remove a sarcoma of the lacrimal gland. I simply peeled off the periosteum of the roof of the orbit, removing, of course, the gland itself, and the patient lived for two years, at least, and died from some acute disease which could have no connection with secondary development from sarcoma.

The doctor spoke of there being no

recurrence for, I think, twelve years. I reported, some years ago, before this society a so-called recurrence of sarcoma of the orbit, fourteen years after having enucleated the eye which contained the original sarcoma, and I expressed the opinion that I really did not think it was what you would call a recurrence. If a man lives to the age of fifty-six without the development of sarcoma, and the view is correct that it is a development of the embryonic tissue, why should not this occur in another part without its being a recurrence, when the man is fourteen years older? I do not think that we should always speak of a recurrence of the growth. I think that one can actually circumscribe the disease, and have an appearance *ab origine* at another site.

DR. POSEY: Dr. Claiborne has given us an intimation that, to his mind, the Kroenlein operation should be limited to growths disseminated thru the orbit. To my mind, the indication is a localized growth. If there is a disseminated growth, especially if it is malignant, the thing to do is to take out all the parts, as well as the tumor. As to sewing up the periosteum, I confess not to have found the periosteum of these cases such a tangible tissue as would enable one to sew it. We have found, at Wills Eye Hospital, that fulguration after removal of tissues in the orbit for malignant growth is a very valuable means, for a time, in the checking of further extension of the growth.

DR. DAVIS: I should like to answer Dr. Reeve's question regarding a secondary operation. I did that because I considered an epithelioma to be a malignant growth, belonging to the carcinomatous group, and because I had not done the major operation of removing the growth in the forehead, which was an inch and a half in diameter. Dr. Judd performed that operation, and found that the meninges of the brain had been absorbed, and that the tumor extended into the brain itself. That is why we did the secondary operation so soon. I was interested to know, after we got into the second growth, that it was considered to be a glioma, and especially to have it as the opinion of so

eminent a man as Prof. Ewing, that it was the third growth of the kind that he had had under observation. The question is, whether we could get a glioma following a sarcoma. I should like to have the opinion of some of our pathologists on that point.

Dr. Claiborne: Regarding the removal of the eye first, I have no objection to it whatsoever. My opinion was based on a case that I saw Dr. Posey operate on some time ago, a large sarcoma of the orbit. He cut above the brow, and attempted to remove all the tissue, but could not get all out, and sewed it up. The patient lived for several years afterwards. It struck me that had he done a Kroenlein, he might have gotten out more, and prolonged the patient's life still further. I think that in certain cases of that kind, where the sarcoma is extensive, it might be well to try the Kroenlein operation. The patient lived three or four years, and was seventy-five years of age. The case has been reported before.

Ophthalmoscopic Conditions Simulating Sarcoma of the Chorioid.

DR. HARRY FRIEDENWALD, Baltimore, Md., read the paper published in full on p. 822.

DISCUSSION.—Dr. Hiram Woods, Baltimore, Md.: Dr. Friedenwald has been kind enough to let me observe one or two of these cases with him, and I can bear out the truth of what he says. I could not make the diagnosis on the ophthalmoscopic appearances, but the question of transillumination comes up. I recall the generally accepted principle that you get transillumination in non-malignant growths, and do not get it in the others. Fridenberg, I think, was the first to tell us about it.

Basing my procedure on that opinion, I two or three years ago enucleated the eye of a child three or four years old, with a large mass in the vitreous, without any evidence whatever of previous inflammatory trouble. The transillumination was completely shut off, and yet it proved to be a double inflammatory deposit. I saw one of the cases that Dr. Friedenwald formerly reported, in which this massive exudate

was evidently getting larger, with inflammatory reaction. We do not know much of the pathology of this class of cases, but we should have some way of diagnosing them.

Dr. Arnold Knapp, New York City: The principal elements of the cases that Dr. Friedenwald describes, I think I have seen two examples of, and in both there was a circumscribed mass characterized by having a curious dead-white grayish color. There was no inflammatory symptom, so far as the optic nerve was concerned. Both were in patients around thirty. The feature that both had was, that in the neighborhood of the swelling there was an area like the degeneration we find in certain types of retinal disease, a little bank of hemorrhages with exudates; and I should like to ask whether that was observed in the first case. These two cases are being watched. The diagnosis of a probable solitary tumor was made. The process has remained stationary in one case for three years, and the other I have not seen for a year.

Dr. Friedenwald: There was no sign of inflammation nor hemorrhage, and the retina and optic nerve in the first case were normal. Vision was almost perfect at the time of enucleation.

Transient Homonymous Hemianopsia.

DR. HENRY H. TYSON, New York City, read the paper on this subject published in full on p. 831.

DISCUSSION.—Dr. J. H. Claiborne, New York City: Dr. Tyson referred to a case that I reported several years ago. As I stated at that time, this man was an alcoholic subject. He did not drink all the time, but had periodic tears. Being quite ill after one of these, he was given large doses of salicylat of soda. Several doctors in his home town could not find out what was the matter with him. I made a careful examination, and discovered it.

The day before yesterday, while I was looking over this paper, a young man, sixteen years of age, came into my office with astigmatism of six diopeters in the right eye, and slight astigmatism in the left eye. He stated that, from time to time, he had little

defects in vision. One week before he had been taken suddenly blind and, at the same time, the right arm was numb and the entire right side. I examined him carefully at that time, and a week or ten days afterwards, and there was no difference whatever. The optic nerve was normal, and the hemianopsia had disappeared. I never saw a case of this transient, fugacious hemianopsia in a person so young as that. He was not a neurotic subject.

Technic of Corneal Tattooing.

Dr. Samuel Theobald, Baltimore, Md., read the paper on this subject published on p. 847.

Hypermetropia Responsible for Heterophoria, Astigmatism, and Myopia.

DR. S. M. PAYNE, New York City, read a paper with this title which will be published in the next issue of this Journal.

Dr. J. H. Claiborne, New York City: I am acquainted with Dr. Payne's work in the past, and regret that time is lacking for all to discuss it. The paper represents a great deal of thought and deliberation, and shows wonderful patience in the study of that subject. One point that I should like to make is regarding the causation of myopia. Some years ago I wrote a paper on the management of myopia, and made a plea for its complete and perfect correction in youth, based on the view of Gould. When Dr. Payne speaks of hypermetropia as the cause of myopia, I do not quite understand his contention.

Dr. Payne: Dr. Claiborne said something about myopia. I do not know that I have ever seen a case of posterior staphyloma with less than eight diopters of myopia. We have cases of myopia before it reaches that stage, where the fundus looks entirely normal. We see sometimes, in these cases of myopia, a purple line around the cornea, showing that the sclera is thin and shows the choroid through. I think the constant pulling of the muscles in high degrees of hypermetropia

increases the astigmatism. The cornea may be conical, and that increases the depth of the anterior chamber. I do not see why the pulling of all these muscles from that particular point would not increase the curvature anteriorly to a sort of conical form. I believe that this is the start of myopia, and that later it extends to the back part.

Conservative Treatment of Asthenopia in Children.

DR. EDWARD R. WILLIAMS, Boston, Mass., urged that the conservative treatment of asthenopia in young children requires the careful assembling of facts. First get the refractive data; then attempt to separate real from apparent complaints of the child which simulate asthenopia; finally give glasses for large refractive errors. For doubtful cases get a careful history from the parent and start palliative treatment while keeping the child under observation. After two weeks' treatment with soothing collyria all asthenopic symptoms often cease entirely. Palliative treatment means a larger proportion of pupils do not receive glasses until general treatment has been tried. The temporary decrease of vision accompanying conjunctival irritation needs only conservative treatment with collyria. Observe the mental attitude of the child; a resignation to the inevitable will stop eye-strain complaints. Decreased accommodation, after study or play, is a handicap to effective preparation of home lessons.

DISCUSSION.—Dr. S. M. Payne, New York City: A child with hypermetropia may refuse the glasses. One with two or three or four diopters may refuse any glasses for his distance. These children always hold the book too close. They do it to magnify the letters. If you will put a convex glass on the patient, you may get the full correction. The nearer you come to the total amount of the hypermetropia before that child's eyes, the further he will move the book away.

SECTION ON OPHTHALMOLOGY, COLLEGE OF PHYSICIANS, OF PHILADELPHIA.

October 17, 1918.

DR. S. LEWIS ZIEGLER, Acting Chairman.

Diagnosis of Motor Anomalies of the Eyes.

DR. ALEXANDER DUANE, of New York, addressed the Section by invitation, on "The Basic Principles of Diagnosis in Motor Anomalies of the Eye." He said that tests for the ocular muscles must obviously be based on answers to the following questions:

- (1) What are the normal movements of the eyes singly and in conjunction?
- (2) What are the possible perversions of these movements, and what distinctive evidence of its presence does each particular perversion afford?
- (3) What are the most ready means of bringing these distinctive evidences to light?

The first question was subdivided into the following queries: (a) What are the actions of the individual muscles of the eye? (b) How are these coordinated to move each eye by itself? (c) What are the coordinated movements of the two eyes acting together?

Dr. Duane then discussed these questions under the headings: (1) Action of individual muscles. (2) Monocular movements. (3) Binocular movements. Following this he spoke of the varieties of Motor Anomalies: (a) Affections of conjugate movements, (b) Affections of convergence, (c) Affections of divergence.

Finally the tests to be used and what they determined were discussed in detail.

Dr. Duane's paper did not readily lend itself to abstraction, and accordingly to appreciate must be read in full.

DISCUSSION.—Dr. Howard F. Hansell thanked Dr. Duane for his profitable and interesting essay. The subject as presented was so comprehensive that Dr. Hansell limited his remarks to one or two points only. He was

particularly interested in the emphasis laid upon the physiologic action of the muscles, first of one eye and second of both eyes in association, for unless our conception of physiology is clear, our interpretation of pathologic states will be obscure. Dr. Duane stated, for example, that outward rotation was accomplished by the contraction of three muscles, the external rectus and the two obliques, the eye being held in equilibrium by the superior and inferior recti, and of the six muscles only one is inhibited. It can be readily understood that this apparently simple function is in fact a most complicated one.

The contraction of one set of muscles must be balanced exactly not so much by inhibition as by relaxation of the antagonists, and how much more complicated it is when we remember that the muscles of both eyes act simultaneously in equal degree of contraction and relaxation. Thus in every movement the twelve extraocular muscles and at least three pair of cranial nerves with their centers and cranial connections are involved. It would seem that treatment directed to the changing of the attachment of one or even two muscles by operation might be successful in only a small proportion of cases.

Dr. Hansell thought that probably the most accurate test for the detection of low grades of phorias was the Maddox rod. For degrees higher than two, he had found the cobalt glass satisfactory. Thru it the image was small and colored and easily recognized in a moderately darkened room, and its position in relation to the true light signifies correctly the altered direction of the visual axis of the eye behind it.

Dr. William Zentmayer said he could add nothing which would further clarify the subject which Lieut. Duane had so elaborately and lucidly presented. He thought it might be of interest, however, to state his experience with the different procedures employed for diagnosis. In teaching he had found the axiom that "the false image has the position and inclination which the affected muscle gives to the eye when

acting normally" and that "in paralysis of the elevators and depressors, that the eye is paralyzed whose image is the lower, the correlation of the terms elevator and higher, and depressor and lower help to fix the relations of the false images." The groupings of the vertically acting muscles has also been of great value.

In working out a case one of the difficulties in studying the images when unassisted is to have the patient keep the head in the primary position. While he had no experience with the method of Bielschowski, advocated by Landolt, of having the image fixed and moving the head of the patient to obtain the different cardinal positions, it would seem to overcome this difficulty. When we consider how rarely by the ordinary methods the patient is able to recognize the tilting of the false image in paralysis of the elevator and depressor muscles, we appreciate the debt we owe to Mauthner and Duane for emphasizing the advantage of making a differential diagnosis by the difference in the vertical separation of the images in adduction and abduction. By using a long test object such as a cane, the tilting of the image is made easier of recognition.

The screen test is of especial value, as it is an objective test. With the parallax test Dr. Zentmayer had found it difficult to have a patient of ordinary intelligence recognize the movement of the image. In studying heterophoria he routinely used the Maddox rod, as it had always seemed that the displacement of the image on the retina which the phorometer produced, introduced a complicating factor.

Dr. S. D. Risley thanked Dr. Duane for the very clear statement he had given of the groups of muscles involved in the associated movements of the eyes in the cardinal fields of binocular fixation. In his personal expe-

riences Dr. Risley had found that abnormalities of the binocular balance, excluding paralysis, might be classified into two general groups, relative and absolute; the latter being due to some abnormality in the attachment of one or more muscles of the group, and were usually associated with anomalies in the form of the orbital walls, and these were due to distortions of the anterior segment of the skull.

In the routine of office work, the main difficulty was to discover which muscle, or associated groups of muscles, were faulty; since the secondary or spastic contractions of the opposing muscles were often misleading. He felt that it was important to place the patient at rest under, for him, unusual conditions, so that he could not use the efforts he was accustomed to make, to correct the abnormality of balance.

For this he himself employed a fixed apparatus he had devised, in looking through which the patient had a circular field as in a binocular field glass. Dissimilar images in the two eyes were secured by a dark ruby glass over one and a multiple Maddox rod over the other. Fixation was on a small point of light placed at six meters at the height of the patient's eyes. This secured a primary posture and removed all tendency to overcome by strain the existing abnormality.

It was important that the accommodation should be completely set aside, by the continuous use of a cycloplegic and a glass correcting absolutely the static refraction of each eye. These should be carefully centered in the apparatus, and all measurements of the binocular balance made through them. While he agreed with Dr. Duane as to the value of the cover or screen test in many conditions, he used in preference to this the conditions above described.

J. MILTON GRISCOM, Clerk.

ABSTRACTS

Poulard and Real. Enlargement and Regulation of the Orbital Cavity for Prosthesis. (*Ann. d' Ocul.*, Jan., 1918, p. 41.)

These authors comment on the lack of permanent results which tend to follow operations for the restoration of the conjunctival sac. Cutaneous flaps are not successful, because they are placed in a cavity already too shallow, which they make more so. Epithelial grafts are less open to this objection, but they are too delicate and the results are poor.

Pieces of glass or hard rubber placed for a long time in the cavity increase it slightly, but cannot distend it because they are loose and can exert no pressure. In order to accomplish this, the authors constructed an apparatus which is comfortable and exerts a selective pressure action on the parts requiring it. It consists of a plate conforming to the upper orbital margin, modelled in the way a dentist makes a plate, held in place by elastic bands which pass around the occiput and prevent its displacement. This makes a firm support for the active part of the apparatus, which is a vertical steel rod with a groove in a tube attached to the plate. It can be raised or lowered at will. To the lower part of the rod is fastened another tube. Screws permit the rods to be fastened at any length. The second rod terminates in a discoid plate, upon which is to be placed the plastic mass which is to be moulded upon the irregularities of the cavity. By means of these rods the plastic dilating mass can be moved in any direction.

The first step in the operation is to take an impression of the cavity, and a model is made in three pieces. Cicatrices present are cut, and this is followed by application of the dilating apparatus. The disc is covered with a soft plastic mass, which is introduced into the cavity and pressed moderately against the walls so as to take on the contour of the cavity, and especially

so as to interpose between the cut lips of the cicatrices. By means of its attachment, the plate is anchored firmly to the orbital margin and remains in place day and night, being removed only once or twice a day to clean the cavity. It is well borne by the patient. On the succeeding days plastic matter is added until the desired result is obtained. Then it is replaced by a definite mass of vulcanized rubber. Epidermization must be complete before the artificial eye is inserted. Even afterwards, the apparatus should be worn at night if there is any doubt about the permanence of the result.

C. L.

Koster-Gzn., W. Spontaneous Resorption of Senile Cataract and Other Spontaneous Cures. *Zeitschr. f. Augenheilk.* v. 36, p. 57.

In 1913 this author saw a healthy, strong man of 77 years who stated that in his fiftieth year he had begun to suffer from cataract; with the right eye especially he was very soon unable to see; in the left eye the cataract progressed but very slowly. Twenty-five years ago, i. e., two years after his affliction had begun, Prof. Snellen proposed the extraction of the cataract in the right eye, but patient had refused. Up to the time when author examined him he had been able to do his work fairly well with the left eye. He had never suffered from diseases of the eye nor from other diseases frequently associated with cataract; the cataract has been diagnosed previously, just as now by the author as a senile cataract.

On January 22, 1913: V., L. = 3/60, with 2.5 = 6/24; cataract. R. = 5/50, with + 9 = 6/60. Deep anterior chamber with pupillary opacity which in several places when light was transmitted, allowed the penetration of red light. When the pupil was dilated no remnant of the nucleus of the lens could be found. Normal pupils on both sides, normal tension and good projection. It is therefore, a case of

spontaneous resorption of a senile cataract of the right eye.

Jan. 27, 1913, discision of the membranous cataract with two needles according to Schweigger. Jan. 30, V., R. with $+10 = 6/12$. Oct. 13, with $+10 = 6/6$.

No swollen remnants of the lens were visible in the pupil. The lower V. during the first three days after the operation was caused by mydriasis, as the remnants of the membrane still disturbed the vision.

Author saw the patient again in September, 1915. The left eye had now $4/60$ with $+2$; the anterior chamber had become somewhat deeper, so that it appears as if in this eye, too, resorption of the lens had begun.

It has been impossible to find any cause for the resorption of the cataract; in patients of this sort there must be some determining factor, either in the whole body or in the eye, for this unusual process, since the lens does not become overmature and calcified in the usual way; but from the very start is affected in a different way by the fluids of the eye and, altho very slowly, dissolved. It would be a great triumph if we could start this process at will, for the patients would undoubtedly prefer this spontaneous cure, no matter how satisfactory the results of the operation for cataract are. It does not seem impossible that we may yet be able to accomplish something in this direction.

In connection with the just mentioned spontaneous cure of senile cataract, it may be permitted to remind the reader that the same thing happens in young children. In those cases we are not in a position to state that the cataract is not a traumatic one or that a trauma may have precipitated the absorption of an already existing cataract. We then, as is well known, find only a cataracta membranacea. A second mode of spontaneous cure of cataract in the aged, that of spontaneous luxation, is not so very rare, though a slight commotion of the body, due to a misstep, etc., is usually a necessary condition. The author had opportunity to observe several such cases, and altho

the eye with a cataracta untena is always exposed to secondary glaucoma, thus possibly making an extraction absolutely necessary, author has been able to observe others for many years, the eye quiescent and with excellent vision. But it is just this danger of increase of pressure or even chronic cyclitis which restrains us from imitating this natural form of treatment. Nature's process was most probably imitated in those successful cases of reclinaton or pushing down of the cataract without injury to the lenticular capsule, which was practiced in older times. The other cases, and they were probably in the majority, in which the cataract was injured, must have become a prey to either acute or chronic iridocyclitis, since the lens tissue affords a good medium for the growth of the bacteria introduced during the operation; and if the lenticular capsule was injured there must have been an inflammation of the ciliary body even without infection, since the swelling tissue was of the lens which if pushed deep down into the vitreous body, would cause inflammation chemically and even purely mechanically. The lens therefore should never be touched by a sharp instrument if, as has been recommended in several quarters, we should practice the depression or reclinaton of the lens even today. It would seem best, after making a small opening with a narrow knife, to insert a dull needle into the anterior chamber and to tear off only the zonula with this instrument. In this way the uninjured lens can be luxated fairly easily in the pig's eye, though it is more difficult to push it down. The author has never performed the operation on the human eye.

Moncrieff, W. E. S. Treatment of Trachoma by Excision of the Tarsus and Tarsal Conjunctiva of the Upper Lid. Indian Medical Gazette, Vol. 51, No. 8.

Trachoma is probably the most frequent cause for rejection of otherwise desirable recruits for the Indian Army. It very often complicates other eye diseases, and in itself causes an enor-

mous amount of partial and total blindness.

On a recent tour in Marwar (Jodhpur State) the author made the following note of cases seen in three district dispensaries, in which there were sixty-four blind eyes in forty-two persons, mainly due to trachoma with its complications—pannus, ulcer, perforation, entropion, xerosis, etc. He noted that one rejects a recruit with trachoma straightway; and it is therefore not prevalent in the Indian Army, owing no doubt to the strict medical examination before and the healthy existence after enlistment.

As regards treatment, he considers that astringents, caustics and resorbents are hopelessly inadequate; and he has gathered rather damning evidence as regards the caustics and copper. Carbon dioxide snow has been tried and found to be no more efficacious than caustics. Few cases are suitable for expression and grattage. Subconjunctival injections are disappointing. Excision of the conjunctival fornix has been done only a few times. Previously to last year, he has occasionally removed most of the tarsus as a modification of the Snellen operation, but recently has done it more often.

There are two methods of operation, one a simple excision, leaving a raw surface, the other an excision followed by undermining and suturing of the conjunctiva. Both are described in detail. Either being similar to those operations in vogue in America. He has excised the tarsus of the lower lid in three cases, but it is as a rule, unnecessary. As the results of the operation, the lid does not lose its shape. On the contrary in advanced cases, its shape is improved and the levator muscle can still exercise its function.

It seems that the secretion of the

Meibomian glands is so altered by the disease that nothing is lost by their removal.

At one hospital he has done the operation on 47 eyes, having records of 54 cases, 26 simple excision, 15 excision with suture of conjunctiva, 13 simple excision with removal of skin for entropion. He considers that involvement of the tarsus causing thickening and deformity or short of this, commencing cicatrization in the tarsal conjunctiva, with or without corneal complications, are absolute indications for excision. He does not operate during an exacerbation of the disease.

The social standing of the patient, particularly in India, should be noted; as, for instance, a case with early trachoma may appear once, and if only given temporary relief it may be years before it comes back and then generally blind without hope of recovery of full vision. Likewise, case and results of operation are noted.

H. V. W.

G. F. Cosmettatos.—Recurrent Epithelioma of the Ocular Conjunctiva.—*C*
Ann. d' Ocul., v. 155, p. 32.

Cosmettatos describes a case where death occurred as the result of metastasis in the larynx, in spite of two operations. The first was by a careful dissection of the tumor and extirpation with normal conjunctiva, followed by cauterization of the base. One year later the patient returned, with a large tumor mass covering the eye. The eye was enucleated and as much of the conjunctiva as seemed to be affected was removed. The tumor was found to be an epithelioma, which had invaded the corneal parenchyma and even the canal of Schlemm. Three illustrations of sections of the tumor accompany the article.

C. L.

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Proof should be corrected and returned within forty-eight hours to the Associate Editor. Reprints may be obtained from the printers, Tucker-Kenworthy Co., 501 S. La Salle St., Chicago, Ill., if ordered at the time proofs are returned.

Subscriptions, applications for single copies, communications with reference to advertising or other business, should be addressed to

H. A. FOX, Manager, 7 West Madison St., Chicago, Ill.

JESSE SYDNEY WYLER.

Death has taken several close friends and active supporters of this journal during the first year of its existence, Todd, Burrows, Ray, and Guilford are all sadly missed; but our immediate staff was first invaded when Jesse S. Wyler of Cincinnati died October 23d, from broncho-pneumonia following influenza.

In the first months of the year, when our organization was incomplete and abstracts of foreign literature were hard to get, his excellent presentation of articles appearing in French could be depended upon and helped materially in meeting the emergency; and the brief practical papers he has contributed to our original department are of the kind that the profession always needs.

COMPLETE FILES.

Subscribers whose files for the year 1918 are not complete should at once make application for the numbers required to complete them. Those who

fail to do so will not be able to obtain the issues desired, as comparatively few copies are available for this purpose.

It is generally true that the earlier volumes of a journal are difficult to obtain, and often command more than their original price. As the list of subscribers gradually increases, some of the later subscribers wish to obtain complete sets of the earlier volumes, of which but a smaller number were printed. This is especially the case with a journal like this, containing articles that will be consulted in future years, and a fairly complete review of the world's literature relating to a special subject. As a service both to yourself and the profession in general, keep this first volume.

If you do not care to have the volume bound, tie the numbers together, wrap them in paper to keep out the dust, and write thereon the name of the journal and volume. You will then be ready to supply a demand that will arise; or if later you should desire to bind them, you will have the set complete. It is coming to be recognized that complete

sets of good journals are the most valuable part of any medical library; and journals so tied up and labelled can be consulted, even tho less readily than a bound volume.

OUR BEGINNING.

In our first number the combination of ophthalmic journals was spoken of, "not as an achievement, but as a beginning—an opportunity." With the first completed volume before us, we can see more exactly what this beginning has been; and the opportunity that begins to open out more widely before us. Some things have been put to the final test of practicability—they have been done. Others have been approached until their early achievement is strongly probable.

To begin with the financial basis; it has been proved that 2,000 ophthalmologists in America were willing to spend ten dollars per year each, to improve the current literature of their special branch of medicine, and to get a better command of that literature. This seems very moderate as an annual business expenditure; but a year ago nobody knew that so many oculists would make it. From the subscriptions paid in for the first volume every proper expense chargeable thereto has been met; and by a sacrifice on the part of the workers for the journal of a return they can henceforward expect, a good working balance has been established that will give the journal in the future every advantage of cash discounts and advance purchases.

When the combination of journals was proposed, one of our prominent ophthalmologists of large business experience wrote: "I have had a little experience in being the 'angel' for a medical journal, and I feel confident that the plan as outlined, with that price will not succeed." By the close of the year those who put their cash and their property into this undertaking, have received convincing evidence that they did not give their money away or waste it; but made a sensible investment that is yielding a reasonable rate of interest.

This achievement takes added significance because of conditions in 1918, when most journals cut down their size, and some increased their price. Our most important competitor diminished its size to 48 pages and raised its price from \$7.50 to \$10.00 per year; and its course was fully justified by existing conditions. But the AMERICAN JOURNAL OF OPHTHALMOLOGY has come out with over one hundred printed pages each month (pages 50 to 90 per cent. larger than those of its contemporaries), and less than ten per cent given over to advertising.

In addition to its numbered pages, it has printed 19 insert plates, of a quality heretofore exceptional among American medical journals. Among these were seven of the eight plates printed in colors, that have appeared in that time in the ophthalmic publications of America.

The JOURNAL has not been placed in the hands of subscribers on the 15th of each month, as we wished. But consider some of the obstacles which have made it impossible for some of the biggest business enterprises to get printing done at the proper time: A great shortage in skilled labor for the manufacture of paper and in printing offices. Five coalless days, as our first number was ready for the press. Two printers' strikes, that caused periodicals like the Literary Digest and Collier's Weekly to omit issues; and delay in second class mails, so that the October number mailed in Chicago, October 26th, was received in Denver November 5th. Then with 43% of the Editorial Staff, and 40% of the collaborators in military service, it is evident that the full resources of our JOURNAL are not yet developed.

To point out what has been done under these circumstances sounds like boasting; but we only mention facts that we want every subscriber to the JOURNAL to know and understand. What has been done was made possible by the coöperation of 2,000 professional colleagues. There are in America 4,000 professed oculists, who ought to take this journal, who do not yet do so; nor do they take any other jour-

nal relating to their specialty. Their good and the good of their patients demands that they should have it. They can be induced to take it by active propaganda on the part of our present subscribers. When they do, the service that all subscribers will receive from the *AMERICAN JOURNAL OF OPHTHALMOLOGY* will be enormously improved and extended. Let us go forward.

E. J.

THE OPHTHALMIC YEAR BOOK.

When the plan for combining ophthalmic journals was carried into effect, several workers in the literature of ophthalmology expressed regret that the year-book was to be given up. But it has not been given up. The digest of the literature published from month to month is as complete as that of any preceding year, published in the year book. It is not spread on as many pages, but, owing to the greater number of words to the page, it contains as much as the largest volume of the year book that has preceded it.

In view of the difficulties attending the gathering of the world's literature during a world war, this is a worthy achievement. It is the best possible guarantee that with the return of normal conditions this review of the ophthalmic literature of the world will keep the lead it now has; and will give to English reading ophthalmologists, better resources and facilities for study and literary work, than they have had before.

As will be seen on inspection the digest of the literature has been paged and printed for binding in an independent volume. In this number we publish the bibliography for it, arranged alphabetically by author's names, so that if one does not remember the exact title for it, the author's name will quickly indicate in which paper his writings on any particular subject are to be found. In addition, the subject index following, will indicate where all the important writings on a particular subject are alluded to, even tho the allusions to them do not appear in the titles of the papers.

There have been numerous inquiries about the sources of articles mentioned in the digest; and, publishing the "Digest" from month to month, it was not reasonable to wait to the end of the year for the references to the papers mentioned. These papers had all been noticed in "Ophthalmic Literature" in the months preceding their mention in the "Digest." But to find them there generally required looking over the lists of several months. Several readers and collaborators have suggested the better way of placing the bibliography at the beginning of each section of the digest. And with next month this plan will be adopted.

In addition to bibliography and index we publish this month the title page and table of contents that are required to make this reference book complete and ready for binding. It will make a respectable volume for the one year, but it is possible that some may prefer to wait and have two volumes bound together. The size of page can be cut to that of preceding volumes of the year-book, or it can be kept the same size as the *JOURNAL*.

Some may prefer to bind the "Year Book" part with the bulk of the journal. If this is done it will be found much more convenient for reference if the digest of the literature is separated from the other pages, and all the "digest" brought together in the latter part of the volume. The volume will then be arranged thus: Title page, contents and index for the journal, bulk of journal, pp. 1 to 880. Title page contents, etc., for year book, digest of the literature, pp. i to viii; bibliography and index, pp. 1 to 297.

Such a reference book is worth keeping. The number of ophthalmologists who can appreciate it, and use it to advantage, will increase from year to year; and of such reference books, a complete set is more valuable than scattered volumes.

E. J.

COLLEAGUES RETURNING TO CIVIL PRACTICE.

Now that the problems of the War are practically settled, by the collapse

of the German war machine and the signing of the armistice, it is necessary more than ever to turn our attention to post-war problems. Among these is the question of physicians now in the service returning to civil life. Altho some of these men have been able to keep their practices more or less intact by means of associates or assistants, the great majority took no thought of the future, but closed their offices, gladly giving all they had to their country.

While those of us who were compelled for various reasons to stay at home have done what we could for them in caring for their patients, in the very nature of things their practices have become more or less scattered, and they are confronted with the task of building them up again. For them to let each of their patients know by card or otherwise would be an expensive and often inefficient method.

Altho the face of the profession is steadily set against advertising, it would seem no more than just to allow these men to insert in the daily papers a simple statement that they have resumed the practice of medicine at such and such an address, the same to run for a limited time, say one month. Or as an alternative, the County Medical Society might request the daily paper to run a column devoted to returning physicians. Such a procedure could in no way be construed as a letting down of the bars against unprofessional advertising.

C. L.

BOOK NOTICES

THE AMERICAN ENCYCLOPEDIA AND DICTIONARY OF OPHTHALMOLOGY, Edited by Lieut. Col. Casey A. Wood, M. C., U. S. A., M. D., C. M., D. C. L., Assisted by a Large Staff of Collaborators. Fully Illustrated. Volume XIII. Phonoscope to Protozoic Disease of the Lids. Chicago, Cleveland Press. 1918.

Volume XIII of this monumental book has appeared. The subjects considered are from Phonoscope to Protozoic Disease of the Lids. The larger

articles and those of special importance are those on the Phorometer by G. H. Price, taking 43 pages, in which the various methods and instruments used for measuring muscle deviations are freely described. Then we come to an exhaustive article taking up most of the Book, of 494 pages by Charles Sheard, which indeed will bear close study not only by the preparatory student, but as well by the practitioner. For it is really a fact that most of us have acquired the little knowledge we may have of physiologic optics, mainly by a sort of induction process obtained from the practice of measuring the refraction and by the prescription of lenses, and this almost entirely in cases of deviation from the normal.

Few practitioners indeed know much about the passage of the light into the eye or the dioptries of the eye. Some of us are acquainted with the practical functions of the retina and all of us with the interpretation and appreciation of the outer world thru the sense of sight. Certain it is that in no case do we see the thing itself. We are conscious only of a certain sense impression received from it and the mechanics of focusing these sensations on the retina, and the mental interpretation are all that we are really sure of.

The transition steps of the electrical, chemical and mechanical stimulation of the retina and the physiology, from the retina to the mental receptive centers, are even yet problems engaging the attention of the physiologists and psychologists. The anatomy, however, is well known.

The study of physiologic optics is not very complicated. Very moderate knowledge of algebra and geometry suffices for the reading of all its formulas; and once, started with its study, there is a certain amount of pleasure in following out the laws of light, its refraction, diffraction and reflection. A syllabus of this subject is impossible in this brief review. It must be studied in the original.

A very readable article is one of 29 pages on the ocular relations of pituitary disease by Emory Hill. Likewise of decided interest is the sketch from

the ancient work of Pliny, of his writings having to do with the eye and its treatment. This has been written by T. H. Shastid, and occupies 27 pages.

In addition to the Section on Artificial Eyes in Volume I, which was written in 1913, we find, under the title of Ocular Prosthesis, 11 pages, probably by the managing editor. A good deal of this has to do with the war wounds of the eye, requiring special prostheses. Particular attention is given to the work of Valois and Rouveix in restoration of the socket, mechanical devices and the new form of elastic rubber base for the artificial eye. This is more freely noted in our review of Valois's Book on the One-Eyed of the War.

It is understood that the Encyclopedia is now being translated into Spanish.

H. V. W.

NISTAGMO OCULAR. Enrique Dameno. 8vo, 190 pages. Cordoba and Buenos Aires. 1918.

This is a thesis, presented to the Faculty of Medical Sciences of the National University of Buenos Aires, for the degree of Doctor of Medicine. By it we are again reminded that there is growing up in the great republic of the south temperate zone an important center of medical study and teaching.

The work is a general review of the current knowledge of the subject of ocular nystagmus, arranged in ten chapters. These are entitled: Congenital Nystagmus; Nystagmus and Nutatory Spasm; Miners' Nystagmus; Secondary Nystagmus; Voluntary Nystagmus; Nystagmus with Diseases of the Nervous System; Myoclonic Nystagmus; Nystagmus with Cerebral Tumors; Vestibular Nystagmus; and the Pathogenesis of Nystagmus. There is also an appendix dealing with the Examination of Nystagmus.

Each condition is illustrated by abstracts of cases, some from the author's own observations, some from the literature. The account of the pathogenesis briefly reviews the various hypotheses that have been put forward; and

the more important experimental work done to throw light on this subject.

The makeup of this volume is attractive, but strikes one who has felt the pinch of restricted paper supply as extravagant. It uses the same amount of paper as two numbers of the AMERICAN JOURNAL OF OPHTHALMOLOGY, for a thesis that would be printed on less than 40 pages of this journal. This matter of buying or storing unneeded paper grows in importance as one tries to accumulate a medical library.—E. J.

EQUILIBRIUM AND VERTIGO.

By Isaac H. Jones, Major M. R. C., U. S. Army. With an Analysis of Pathologic Cases by Lewis Fisher, M. D., Philadelphia. Adopted as Standard for Medical Division, Signal Corps, Aviation Section, by Surgeon General, and Chief Signal Officer, U. S. Army. Octavo 444 pages, with 130 illustrations. Philadelphia and London. J. B. Lippincott Company. 1918.

It almost seems that a new specialty has arisen, that of Neuro-Otology. At first sight, apparently complicated and at any rate, so intimately connected with Otology Neurology and Ophthalmology, that the head Surgeon must make himself proficient in these new methods of examination. It seems that we must add to the commonly accepted five senses, the sixth, muscle, joint and splanchnic sense; by which the individual performs coördinate acts automatically and unconsciously and the seventh sense, the kinetic-static, which is presided over by the equilibratory portion of the ear, the labyrinth; and is a separate sense as truly as that of hearing or sight.

Perfect equilibrium is accomplished thru an harmonious coöperation of the sight, muscle sense and most particularly of the kinetic-static sense; and they are intimately connected.

Vertigo is always due to disturbance of the labyrinth, due to a direct attack of this apparatus whether the primary cause be refraction, indigestion, Bright's disease or what not. Vertigo may be caused by—Involvement of the

ear mechanism; (1) by a lesion in the ear itself; (2) by a lesion affecting the intracranial pathways from the ear; (3) by ocular disturbance, either thru the eye muscle nuclei or thru association fibers, from the cuneus to the cortical terminus of the fibers from the ear in the posterior portion of the first temporal convolution; (4) by cardiovascular disturbance and (5) by toxemias from any organ or part of the body.

In any case, the first thing to be done is to examine the ear mechanism, where if the functions are normal, we narrow the diagnosis down to; (1) a purely functional neurosis, (2) an ocular disturbance or to an evanescent toxemia the course of which must then be looked for.

A number of pages are given to The Ear and Aviation, to The Ear and Seasickness; and what is particularly important to the oculist is The Ear in Syphilis; for it shows that the latter has a direct affinity for the 8th nerve, and that tests of this give a valuable index of the central nervous system of much simpler application than the Wassermann tests of the spinal fluid.

The Ear and the Neurologist are briefly discussed. Again of interest to the ophthalmologist is the study of the tests in ocular palsies where favorable prognoses may be given if it is found that the turning and douching test give proper responses. Spontaneous nystagmus, studied by these tests, provides a means of approach in determining its cause or the site of the lesion. Naturally the ear surgeon, or as most of us are "head surgeon," is the man to carry out these examinations.

An exhaustive study of the physiology and anatomy of cerebral localization is given. The study of nystagmus, of the past pointing, and of the falling tests by the turning chair and by douching, is exhaustively described. Pathologic consideration of the cases is gone into in detail. A very complete index is appended. The book is well printed, freely illustrated and well bound.

The text is more lucid and possibly more instructive than other books on the same subject, and it has been

brought well down to date and systematized. From an oculist's and printer's standpoint, however, we would prefer not to have had it on glazed paper, except as far as the phototint illustrations go.

Certainly this contribution to literature is of great value to the ophthalmologist, and this form of examination should be in constant use for the class of cases indicated.

H. V. W.

THE TWIN IDEALS An Educated Commonwealth. Sir **James W. Barrett**, K. B. E., C. B. C. M. G., M. D., M. S., F. R. C. S. (Eng.) Temporary Lieut. Col. R. A. M. C. Two volumes, 8vo, pp. 544 and 524. Illustrated with Maps and Diagrams. H. K. Lewis and Co., Ltd., 136 Gower St., London, W. C. I. 1918. Price 25s. net.

While there is little in these two volumes which has to do with ophthalmology, yet the fact that one of our well known confreres is the author, and an authority on political economy, necessitates a notice in our JOURNAL.

It may seem strange to us that an eye surgeon should delve into this subject; and take such a prominent part in the political management of the commonwealth as is done in other countries. The medical men of America do not often devote themselves to such public interests; their activities are absorbed largely in their medical professional work. Indeed we seem to be too busy with the practice of medicine, particularly those who have become more eminent or widely known; and politics is in disfavor with the profession in America.

In other lands, medical men sit in the Legislatures, in the City Councils, in the State, Provincial and General Legislatures to a greater extent than in the United States; and they seem to suffer no loss of prestige in a medical way therefrom. It is certainly different here, for when a Doctor goes into politics, his career as a medical man is usually ended.

The essays, memorandums, articles and letters, republished in these two volumes, were originally put in print in the various newspapers, magazines and government reports of Australia. Many references thruout the book are made to the menace of Germany, as well as to certain economic improvements in vogue there. Flattering references for the most part are given to America, to our writers, particularly to Lincoln and to our public institutions, some of our universities and to the American Medical Association.

The description of the development of Australian institutions gives a valuable insight into the evidences of the mode of thought in that country, and the changes of society; and offers many suggestions as to the building up of that Commonwealth upon eternal principles.

Of special ophthalmic notes, we find some on trachoma in the State of Victoria, and the influence of venereal disease on the eye, which is touched upon in a number of the articles.

The work is well written in a popular style, and the author is to be complimented upon its publication.

H. V. W.

BIOGRAPHIC SKETCHES.

THOMAS HALL SHASTID.

STEPHAN BERNHEIMER, of Vienna, died of chronic nephritis March 19, 1917. Born at Trieste in 1861, he was a nephew of the famous ophthalmologist, Brettauer. He studied medicine in Vienna, and, while still a student, published an original work entitled "Optic Nerve Fibers in the Human Retina," as well as a translation from the Italian of Bizzozzero's "Handbook of Clinical Microscopy." He received the medical degree at Vienna in 1885.

From 1885 to 1890 he was first assistant to Otto Becker in Heidelberg, and, in 1888, began to practice in that city. After Becker's death, he remained in Heidelberg for one year, then removed to Vienna, where he was first assistant to Ernest Fuchs. In 1900 he removed to Innsbruck, in order to accept the full

professorship of ophthalmology at that place. After fifteen years he received the full professorship at Vienna.

Bernheimer's writings, which are numerous, relate almost exclusively to congenital ocular anomalies, and to experimental histologic studies on the nervous mechanism of the eye.

PAUL GUILFORD, of Chicago, while at his home in La Grange caring for his wife and four children who were seriously ill with influenza, himself fell a victim to the disease, which quickly developed into the particularly virulent type of pneumonia so prevalent in the present epidemic. The fatal termination came October 19th, only three days after the onset of acute symptoms.

Dr. Guilford was born in Lebanon, Pa., in 1870. He attended the public schools of that city and then began the study of medicine, graduating from the medical department of the University of Pennsylvania in 1891. The following year was spent as an interne in the Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases, where he enjoyed the tutelage of the late Dr. Weir Mitchell. Having decided to devote his attention to ophthalmology, he served a full term of one year in the Wills Eye Hospital. In 1894 he took up his residence in Chicago and began active practice, being associated for some time with Dr. S. J. Jones in the St. Luke's Hospital Dispensary.

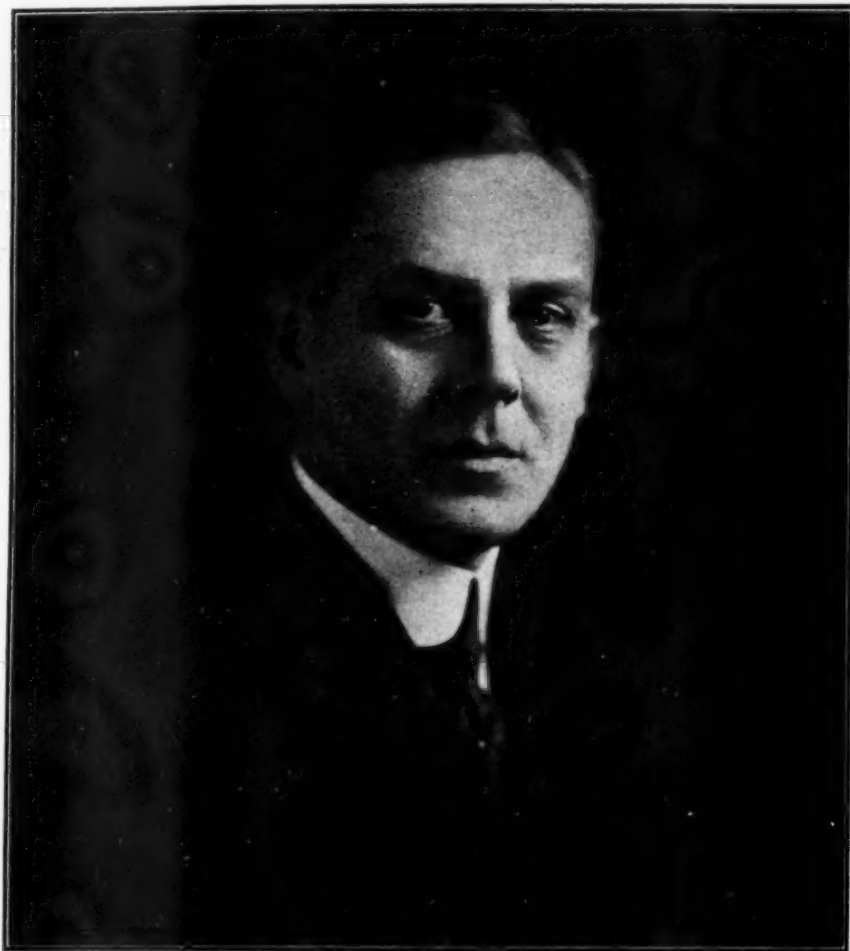
In 1900 he entered into a business partnership with Dr. Frank Allport, and this association continued unbroken for eighteen years, up to the time of his death.

Dr. Guilford was by nature of a rather retiring disposition, and always bore himself with a quiet, modest dignity; his honest, upright character, combined with the qualities of comradeship, had endeared him to the hearts of all his colleagues.

In 1914 he was elected Secretary of the Chicago Ophthalmological Society, and because of his faithful devotion to the duties of this office, he was twice reelected to the same position, and in 1917 the Society further honored him by electing him President.

Dr. Guilford found time, out of the busy routine of an extensive practice, to make some valuable contributions to ophthalmic literature. He edited a section of Wood's "System of Ophthalmic Operations," and was one of the collaborators of "The American Ency-

EWALD HERING, one of the most famous of modern ophthalmologists, passed from his labors on January 26 of this year. Born August 5, 1834, in the parsonage at Alt-Gersdorf (Lausitz), Kingdom of Saxony, he studied at Leipsic, where he was chiefly influ-



Paul Guilford, 1870-1918

clopedia of Ophthalmology." He was Assistant Oculist and Aurist for the Chicago and Northwestern Railroad, for the Chicago Orphan Asylum, and a member of the ophthalmological staff of St. Luke's Hospital. He was married in 1906 to Miss Ethel Hamline. His widow and four children survive him.

enced by Carus, Fechner and Weber. It seems, however, to have been due to the influence of his friend, Coccius, that he turned his attention especially to the eye. To Coccius, in consequence, he later dedicated his work, "Teaching of Binocular Vision."

For a time Hering practiced in Leipsic, but, in 1865, was called to the chair

of physiology and medical physics at the Military Academy in Vienna. In 1870 he was called to the like chair in Prague, where he labored with great success for twenty-five years. In 1895 he was called to Leipsic, where he worked incessantly until his death.

Besides the writings already mentioned, Hering published almost innumerable articles on binocular vision, the sensibility of the retina, color vision, the rotation of the eye, the form of the horopter, the laws of binocular depth-perception, etc., as well as a very long list of articles on the physiology of other organs than the eye. The most of his writings appear in "Wiener Akademische Sitzungsberichte," "Poggendorff's Annalen," "Archiv f. Anatomie und Physiologie," "Archiv f. Mikroskopische Anatomie" and Graefe's "Archiv f. Ophthalmologie."

Dr. NICOLAI, well known ophthalmologist of Berlin, was instantly killed on April 13 by a piece of flying shell. Born at Greifswald in 1868, he received his medical degree at the Kaiser Wilhelm Academy at Berlin. For a time he was assistant in general surgery at the clinic of Professor Frölich. Turning his attention to the eye, however, he became a pupil of A. C. Graefe. Settling as ophthalmologist in Berlin, he soon had a very large practice. He was ophthalmologist to the Queen Augusta Grenadier Guard and to the Eye-station in the Garrison Hospital.

FERGUS MENTEITH OGILVIE, a well-known Oxford, England, ophthalmologist, died at his home in Oxford, from pneumonia on January 17. Born in 1860, he studied medicine at Cambridge University and St. George's Hospital, London. At the latter institution he was assistant in ophthalmology. He also studied ophthalmology at Moorfields and the Royal Westminster Ophthalmic Hospital. He began the practice of ophthalmology at Oxford, forming a partnership with Mr. R. W. Doyne. A few years later he retired from practice, and then was made consulting surgeon to the Oxford Eye Hospital. His mother was the founder

of the well-known "Margaret Ogilvie Readership in Ophthalmology."

EDUARD RAEHLMANN, professor of ophthalmology at Weimar, died recently at the age of seventy. He was born March 19, 1848, at Ibbenbüren, Westphalia, and studied at Würzburg, Halle, Strassburg, Paris and London. At Halle he was first assistant to Alfred Graefe, and, in Strassburg, to Laqueur. He received his medical degree in 1872, from 1875 to 1879 was privatdocent in Strassburg, and in 1879 was made ordinarius in ophthalmology at Dorpat. In 1900 he removed to Munich, and just a little later to Weimar, where he was ordinary professor of ophthalmology until his death. He was the first to recommend hyperbolic lenses for keratoconus and irregular astigmatism. His writings, however, which are numerous, chiefly relate to color blindness and the physiology of color vision.

KENNETH MACKENZIE SCOTT, well known as professor of ophthalmology for many years at the Egyptian Medical School, Cairo, died in London, suddenly, on February 19. Born at Morton, Bingley, Yorkshire, he received his training in the liberal arts at the Edinburgh Academy, Edinburgh University, and King's College, London. He received the degree of bachelor in medicine at Edinburgh University in 1887. He was ophthalmic surgeon to the Kasr-el-Aini Hospital, Cairo, from 1889 to 1899. He was also one of the organizers of the Cairo Blind School. Removing to London, he became assistant ophthalmic surgeon to the West London Hospital, and Consulting Ophthalmic Surgeon to St. Mary's Hospital for Women and Children. His writings are mostly on refraction and lid operations.

Dr. SULZER, of Paris, one of the editors of the *Annales d'Oculistique*, died February 9 from angina pectoris. Born at Winterthur, Switzerland, in 1858, he studied at Zurich, Strassburg, and Utrecht. He settled at first in the Island of Java, but in 1889 removed to Paris, thence to Geneva, and, eventually, to Paris again. In 1914, tho 56 years of age, he entered the army of

the allies as ophthalmic surgeon, and labored in that capacity until his ever-increasing cardiac difficulty compelled his return to Paris. The writer desires to acknowledge Dr. Sulzer's very great and ungrudging assistance in the gathering of biographic data about deceased French and Swiss ophthalmologists, and also about various French ophthalmic laws and judicial decisions. Dr. Sulzer's list of writings is a long one. Perhaps his most important contributions were the following, all in the "Encyclopédie Française d'Ophtalmologie": "Détermination de la Tension de l'Oeil. Ophtalmotonométrie" (II, p. 60); "Ophtalmométrie" (III, p. 59); "Les Amétropies Focales" (III, p. 287); "La Presbyopie" (III, p. 1127).

CHARLES HERBERT WILLIAMS, famous American ophthalmologist, died at his home in Cambridge, Mass., June 9, 1918, survived by his widow and two children. Born at Boston, April 19, 1850, he was a son of the still more famous Henry Willard Williams, the first in America to deliver a course of lectures on the eye, and of Elizabeth Dewey Williams. His bachelor of arts was received at Harvard University in 1871, his medical degree in 1874.

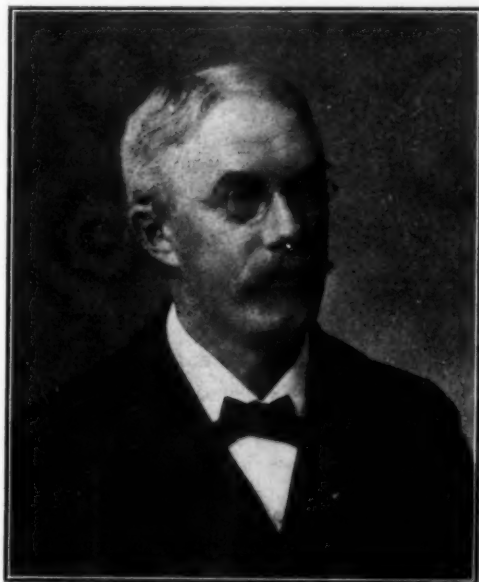
After a number of years devoted to the study of ophthalmology in European centers, he returned to Boston, where he practiced for a time with his father. He married, on October 1, 1884, Caroline Ellis Fisher, afterward removing to Chicago. In 1895, he returned to Boston, where he practiced with his brother, Dr. E. R. Williams.

Dr. Charles H. Williams was one of the earliest investigators of color blindness in this country and an excellent writer on that subject, as well as on errors of refraction. He will, however, be especially remembered as the first to extract a foreign body from the eye by the aid of a Roentgen picture. The picture, we may add, was, in the case in question, made by yet another brother, Dr. F. H. Williams.

Dr. Charles H. Williams was ophthalmologist to the Massachusetts Eye and Ear Infirmary and to the Boston

City Hospital, a member of the Chicago and of the American Ophthalmological Societies.

Dr. Williams, like his father, was a large, tall man, fair complexioned, gray of eye and hair, mustached, quiet and reserved in manner. He was markedly fond of animals, dogs, cats, and horses in particular. He was a Republican in politics, a member of the Boston Common Council, a trustee of the Town-



Charles Herbert Williams, 1850-1918

ship High School, and in many other ways active in civic affairs.

The following passage about Dr. Williams is from the "Boston Evening Transcript": "By the death of Dr. Charles H. Williams his friends have lost a loyal, true and devoted companion, one whom it was a joy to meet, who was always ready to see the best in people, free from envy or any small or narrow point of view. His place in their hearts can never be filled. The community has lost a faithful, unselfish citizen, never seeking his own gain, but glad to contribute his skill and aid in any direction needed, giving the world the benefit of his many inventions, never thinking of profit or fame.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. As these columns go to press on the 30th of the month contributors should send in their items by the 25th. The following gentlemen have consented to supply the News Item Editor with the news from their respective sections: Dr. Edmond E. Blaauw, Buffalo; Dr. V. A. Chapman, Milwaukee; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orleans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. F. Keiper, LaFayette, Indiana; Dr. Geo. H. Kress, Los Angeles; Dr. W. H. Lowell, Boston; Dr. Pacheco Luna, Guatemala City, Central America; Dr. Wm. R. Murray, Minneapolis; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago. It is desirable that this staff shall be enlarged until every city of importance in the United States shall be covered, as well as all foreign countries. Volunteers are therefore needed and it is hoped that they will respond promptly to this call.

DEATHS.

Mr. Brudenell Carter, of London, died October 30th, aged 90 years.

George Cerny, St. Louis, Mo., aged 44, died September 13th, from pneumonia.

William Francis Conway, Albany, New York, aged 31, died November 1st, from influenza.

Lieut. Carl Calvin Culver, M. C., Burlington, Kansas, died in Camp Grant about October 6th, from pneumonia following influenza.

Charles Huff Davis, Knoxville, Kentucky, aged 57, died at his home, October 21st, from pneumonia following influenza.

Paul Guilford, Chicago and La Grange, Illinois, aged 48, died at his home, October 20th, from pneumonia following influenza.

Frederick Carrol Heath, Indianapolis, died October 16th, aged 61.

Roy Richard Longino, Fort Stockton, Texas, aged 34, died at his home recently, from influenza.

David Webster Meyer, Brooklyn, aged 47, died at his home, October 24th, from pneumonia.

Lieut. Timothy Joseph Moran, M. C., U. S. Army, from Pittsburgh, died in Camp Greenleaf, Fort Oglethorpe, Georgia, October 17th, aged 37.

Joseph White Humphrey Porter, Caribou, Maine, aged 40, died at his home, about October 31st, from pneumonia.

Lieut. George Rupp Pretz, M. C., U. S. Army, of Lebanon, Pennsylvania, aged 38, died in Syracuse while on duty, September 30th, from influenza.

John Ranly, Cincinnati, aged 42, died at his home October 13th, from pneumonia following influenza.

James H. Reynolds, Louisa, Kentucky, aged 48, died at his home, October 9th, from pneumonia following influenza.

Charles R. Schoemaker, Baltimore, aged 46, died at his home, October 20th, from influenza.

William Williamson, San Diego, died in Los Angeles, October 19th, from pneumonia.

Jesse Sidney Wyler, Cincinnati, aged 39, died at his home in Ayondale, October 23rd, from pneumonia following influenza.

PERSONAL.

Dr. L. Webster Fox, of Philadelphia, has been elected trustee of the Polyclinic Hospital.

Dr. Luther C. Peter has been elected secretary of the American Academy of Ophthalmology and Oto-Laryngology.

Dr. A. Vogt, of Aarau, is appointed to occupy the chair of ophthalmology in the University at Bale. Dr. Vogt is well known for his work on ophthalmoscopy with red-free light.

Following the meeting of the Fifth National Medical Congress of Mexico, a National Committee for the Prevention of Blindness has been founded, with Dr. J. Joaquin Izquierdo as secretary.

Dr. Wesley H. Peck, of Chicago, chairman of the Eye, Ear, Nose and Throat Section of the Illinois State Medical Society, is desirous of hearing from as many ophthalmologists throughout the state as possible, who will present papers to be read at the next annual meeting of the society. This meeting will be held at Peoria next May.

Dr. S. Lewis Ziegler, of Philadelphia, has been appointed chairman of the Nursing Survey Committee of the Southeastern Pennsylvania chapter of the American Red Cross. The purpose of this committee is active co-operation with the Surgeon General in securing the prompt registration of graduate and pupil nurses—trained attendants and nurses' helpers.

MILITARY NOTES.

Dr. Major H. Worthington, of Chicago, has been assigned to duty at Camp Custer, Michigan.

Dr. George T. Jordan, of Chicago, has received a commission as Captain, M. C., U. S. A., and assigned to Camp Grant, Illinois.

Dr. F. H. Verhoeff, of Boston, Mass., has accepted a commission as major in the Medical Reserve Corps, but has not been assigned to duty.

Dr. D. G. Monaghan, of Denver, has accepted a commission in the M. C. with the rank of Captain, and has been assigned for duty at Camp Lewis.

Dr. Frank Brawley, of Chicago, has been given a captain's commission and assigned to the Air Service Division at Mineola.

Dr. Hans Barkan has accepted a captaincy in the M. R. C., and is stationed at the Base Hospital, Camp Kearney, near San Diego, California.

Dr. H. V. Würdemann, of Seattle, has accepted a commission in the M. C. with rank of Captain and has been assigned for duty at Camp Lewis.

Two more eye, ear, nose and throat men have entered service from Spokane, Washington, namely: Dr. Scott B. Hopkins and Dr. Frank W. Hilscher, both as captains.

Capt. W. McL. Ayres, M. R. C., of Cincinnati, who is attached to Base Hospital No. 110, is now "over there," probably in France. He served some time in Camp Sevier, S. C.

MISCELLANEOUS.

The physicians of California secured the defeat of the health insurance measure by a large majority.

Among 60,000 applicants for the Volunteer Medical Service Corps, 305 have applied as ophthalmologists, and 1,845 as eye, ear, nose and throat specialists.

As the governmental demand for platinum in the making of explosives, etc., has been tremendously decreased by the curtailed war program, it is requested that no further scrap platinum be tendered to the Government.

The National Committee for the Prevention of Blindness held its annual meeting November 26th, at the New York Academy of Medicine. Lieut.-Col. James Bordley, Jr., M. C., Baltimore, delivered an address on "The Government and Red Cross Work for Blinded Soldiers."

Hemeralopia occurred in 7.52 per cent of 2,700 Belgian soldiers examined by Danis. He believed that in many cases it is merely the revealing under army conditions of an old unsuspected tendency to night blindness, brought out by the physical and emotional stress of the war.

A Christmas shop has been opened in Chicago, where the proceeds from the sale of articles will be sent to the Permanent Blind Relief War Fund. Under the direction of the French Government this fund is maintaining five institutions for the rehabilitation of totally blinded soldiers by teaching them practical work by which they may be able to earn a living.

The influenza in San Francisco has produced a number of cases of infection of the conjunctiva and ulcerations of the cornea. This has been noticed in the Stanford Clinic and in private practice. The corneal ulcers have responded promptly to zinc sulphat, 20 per cent applied directly to the ulcer with a cotton tipped probe, and the use of $\frac{1}{2}$ per cent solution zinc sulphat by the patient at home. The conjunctival cases have responded to the zinc sulphat and cyanid of mercury, 1-5000 as a wash.

Because of the fact that individuals who ate liver daily were seen to have escaped

night-blindness, von Stenitzer and Schröder have been using cooked liver in the treatment of that affection. Thirty-four patients with hemeralopia were subjected to the exclusive diet. Of this number thirty made complete recoveries and the other four were benefited. The duration of treatment varied from 3 to 78 days. But at the same time twenty-four controls with night blindness received no treatment, yet twenty recovered completely and three improved.

Artificial eyes of the best quality have been made in France. But even there the cheaper grades were imported from Germany. Eunice Tietjens states in the *Chicago Daily News* that before the war a certain number of women were employed in this work, but the greater part was done by men. Now an appeal is being made in France to young women to take up the manufacture of glass eyes as a profession. The apprenticeship is long, four years at least, and the cost was before the war \$600 or \$800, so that the ordinary working family was not, as a rule, able to afford this trade for the children. But as soon as the apprentice has learned a part of the work she can begin to earn while continuing her course. At the end of two years her salary will be that of an average woman employe. And when she really learns the trade she can make an excellent salary.

According to Bulletin No. 18, Department of Commerce, Bureau of Standards:

By this Bureau, in co-operation with the Inspection Division of the Ordnance Department of the Army, studies were made to the end of devising tests for the optical parts of the 37 mm. gun-sight telescope. A sample panoramic machine gun-sight and an officers' machine gun periscope were submitted for test. A sample periscopic alidade copied from a French instrument was submitted for an examination of the optical parts and for opinion on certain deviations from the specifications desirable in order to permit the instrument to be submitted for quantity production.

At the request of the Medical Supply Depot, the Bureau devised a suitable set of condenser lenses to be used with an acetylene flame for the microscopic work of the Field Medical Service. Nine inspectors of the Signal Corps were detailed to the Bureau of Standards for a course of three weeks' instruction in connection with the design and testing of binoculars. These men will carry on the factory inspection of binoculars, using the Bureau's methods. Routine tests of 113 field glasses were carried on for the Signal Corps during the month of October.

During the month of October 3,020 pounds of inspected optical glass were shipped, representing 5 melts of light barium crown, 7 of barium flint and 9 of medium flint. Special reports have been prepared on the annealing of borosilicate glass for manufacture of optical instruments, and on the annealing of optical glasses for the Navy Department.

OPHTHALMIC LITERATURE

Under this head continuing the "Index of Ophthalmology" heretofore published in *Ophthalmic Literature* will be found the subjects of all published papers received during the last month, that bear to an important extent upon ophthalmology. The subject is indicated rather than the exact title given by the author. Where the original title has been in a foreign language it is translated into English. The journal in which the paper is published will indicate the language of the original.

The names of the different journals are indicated by abbreviations which generally correspond to those used by the *Index Medicus*, the *Journal of the American Medical Association*, and the *British Journal of Ophthalmology*. We will from time to time publish the list of ophthalmic journals, with the abbreviations used for each. Often a single letter discriminates between journals published in different languages. Thus "Arch. of Ophth." refers to the *Archives of Ophthalmology*, published in English; "Arch. d'Ophth." indicates the *French Archives d'Ophthalmologie*; "Arch. de Oftal." refers to the *Archivos de Oftalmologia Hispano-Americanos*, while "Arch. di Ottal." indicates the *Italian Archivio di Ottalmologia*.

In this index of the literature the different subjects are grouped under appropriate heads; so that all papers bearing on the same, or closely related subjects, will be found in one group. The succession of the groups is the same from month to month, and identical with that of the *Digest of the Literature*. Where a paper clearly refers to two subjects that belong in different groups, it will be noticed in both groups.

Each reference begins with the name of the author in heavyface type. This is followed by the subject of his paper. Then in brackets a number with (ill.) indicates the number of illustrations, or a number with (pl.) the number of plates illustrating the article, (col. pl.) indicates colored plates. (Abst.) shows that it is an abstract of the original article. (Bibl.) tells that the paper is accompanied by an important bibliography. (Dis.) means that the paper was read before some society and gave rise to a discussion which is published with it.

The "repeated titles" may render accessible the essential part of a paper, the original of which could not be consulted. These give (in brackets) after the author's name the volume and page of this department of "Ophthalmic Literature" where the title of the paper will be found; and then the journal, volume, and page where the translation or abstract is published.

It is desired to notice every paper as soon as possible after it is published. Readers will confer a favor by sending titles they notice have been omitted, with journal and page of publication; and of their own papers, sending either a copy of the journal in which each appeared, or a reprint. These should be sent as soon as possible to 318 Majestic Building, Denver, Colorado.

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